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<110> Hotez, Peter
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<120> Hookworm Vaccine

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<150> US 60/329,533
<151> 2001-10-17

<150> US 60/332,007
<151> 2001-11-23

<150> US 60/375,404
<151> 2002-04-26

<150> PCT US02/33106
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35 40 45

Arg Arg Val Ala Lys Gly Leu Glu Asp Ser Asn Ser Gly Lys Leu Asn
50 55 60

Pro Ala Lys Asn Met Tyr Lys Leu Ser Trp Asp Cys Ala Met Glu Gln
65 70 75 80

Gln Leu Gln Asp Ala Ile Gln Ser Cys Pro Ser Gly Phe Ala Gly Ile
85 90 95

Gln Gly Val Ala Gln Asn Thr Met Ser Trp Ser Ser Ser Gly Gly Tyr
100 105 110

Pro Asp Pro Ser Val Lys Ile Glu Pro Thr Leu Ser Gly Trp Trp Ser
115 120 125

Gly Ala Lys Lys Asn Gly Val Gly Pro Asp Asn Lys Tyr Thr Gly Gly
130 135 140

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145 150 155 160

Gly Cys Ala Tyr Lys Val Cys Gly Thr Lys Leu Ala Val Ser Cys Ile
165 170 175

Tyr Asn Gly Val Gly Tyr Ile Thr Asn Gln Pro Met Trp Glu Thr Gly
180 185 190

Gln Ala Cys Gln Thr Gly Ala Asp Cys Ser Thr Tyr Lys Asn Ser Gly
195 200 205

Cys Glu Asp Gly Leu Cys Thr Lys Gly Pro Asp Val Pro Glu Thr Asn
210 215 220

Gln Gln Cys Pro Ser Asn Thr Gly Met Thr Asp Ser Val Arg Asp Thr
225 230 235 240

Phe Leu Ser Val His Asn Glu Phe Arg Ser Ser Val Ala Arg Gly Leu
245 250 255

Glu Pro Asp Ala Leu Gly Gly Asn Ala Pro Lys Ala Ala Lys Met Leu
260 265 270

Lys Met Val Tyr Asp Cys Glu Val Glu Ala Ser Ala Ile Arg His Gly
275 280 285

Asn Lys Cys Val Tyr Gln His Ser His Gly Glu Asp Arg Pro Gly Leu
290 295 300

Gly Glu Asn Ile Tyr Lys Thr Ser Val Leu Lys Phe Asp Lys Asn Lys

305 310 315 320

Ala Ala Lys Gln Ala Ser Gln Leu Trp Trp Asn Glu Leu Lys Glu Tyr
325 330 335

Gly Val Gly Pro Ser Asn Val Leu Thr Thr Ala Leu Trp Asn Arg Pro
340 345 350

Asn Met Gln Ile Gly His Tyr Thr Gln Met Ala Trp Asp Thr Thr Tyr
355 360 365

Lys Leu Gly Cys Ala Val Val Phe Cys Asn Asp Phe Thr Phe Gly Val
370 375 380

Cys Gln Tyr Gly Pro Gly Gly Asn Tyr Met Gly His Val Ile Tyr Thr
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aatatatcac agtataatta tgcgatgaat gcaactgcgc catcacttga aagctcactg 1260

gaaccacttt tagaagctta taagaacgtt tcgacgcgaa aagaagaagg tgaaagatta 1320

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35 40 45

Gly Lys Lys Val Thr Ala Phe Leu Gly Val Pro Tyr Gly Gln Pro Pro
50 55 60

Thr Gly Glu Leu Arg Phe Ser Asn Pro Lys Met Val Gln Arg Trp Glu
65 70 75 80

Gly Ile Lys Asn Ala Thr Thr Pro Ala Gln Pro Cys Phe His Phe Pro
85 90 95

Asp Ser Lys Phe Lys Gly Phe Arg Gly Ser Glu Met Trp Asn Pro Lys
100 105 110

Gly Asn Met Thr Glu Asp Cys Leu Asn Met Asn Ile Trp Val Pro His
115 120 125

Asp Ala Asp Gly Ser Val Ile Val Trp Ile Phe Gly Gly Gly Phe Phe
130 135 140

Thr Gly Ser Pro Ser Leu Asp Val Tyr Asn Gly Thr Ala Leu Ala Ala
145 150 155 160

Lys Lys Arg Thr Ile Val Val Asn Ile Asn Tyr Arg Leu Gly Pro Phe
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Gly Phe Leu Tyr Leu Gly Asp Asp Ser Arg Ala Gln Gly Asn Met Gly
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Leu Gln Asp Gln Gln Val Ala Leu Arg Trp Val His Lys His Ile Ser
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Ser Phe Gly Gly Asp Pro Arg Lys Val Thr Leu Phe Gly Glu Ala Ser
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Phe Phe Asp Lys Ile Ile Gly Asn Gly Gly Thr Ile Met Asn Ser Trp
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Ala Ser Arg Thr Asn Thr Ser Met Leu Glu Leu Ser Met Lys Leu Ala
260 265 270

Glu Arg Leu Asn Cys Thr Lys Lys Arg Lys Asp Pro Asn Thr Val His
275 280 285

Arg Cys Leu Val Lys His Pro Ala His Val Val Leu Lys Glu Ala Ala
290 295 300

Val Val Ser Tyr Gln Ile Gly Leu Val Leu Thr Phe Ala Phe Ile Pro
305 310 315 320

Ile Thr Ser Asp Lys Asn Phe Phe Gln Gly Asn Val Phe Asp Arg Leu
325 330 335

Arg Asp Lys Asp Ile Lys Lys Asn Val Ser Ile Val Leu Gly Thr Val
340 345 350

Lys Asp Glu Ala Thr Phe Phe Leu Pro Tyr Tyr Phe Gly His Asn Gly
355 360 365

Phe Ser Phe Asn Asn Ser Phe Leu Ala Asp Gly Glu Glu Asn Arg Ala
370 375 380

Leu Ile Asn Ile Ser Gln Tyr Asn Tyr Ala Met Asn Ala Thr Ala Pro
385 390 395 400

Ser Leu Glu Ser Ser Leu Glu Pro Leu Leu Glu Ala Tyr Lys Asn Val
405 410 415

Ser Thr Arg Lys Glu Glu Gly Glu Arg Leu Arg Asp Gly Val Gly Arg
420 425 430

Phe Met Gly Asp Tyr Phe Tyr Thr Cys Ser Val Ile Asp Phe Ala Asn
435 440 445

Ile Val Ser Asp Ile Ile Asn Gly Ser Leu Tyr Met Tyr Tyr Phe Thr
450 455 460

Lys Arg Ser Val Ala Asn Pro Trp Pro Glu Trp Met Gly Val Met His
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Gly Tyr Glu Ile Glu Tyr Glu Phe Gly Gln Pro Phe Leu Asn Ser Ser
485 490 495

Leu Tyr Lys Glu Lys Leu Glu Asn Glu Lys Ile Phe Ser Lys Asn Ile
500 505 510

Met Ser Phe Trp Lys Asp Phe Ile Lys Thr Gly Val Pro Val Asp Phe
515 520 525

Trp Pro Lys Tyr Asp Arg Lys Glu Arg Lys Ala Leu Val Leu Gly Glu
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Glu Ser Val Asn Asn Ser Tyr Pro Asn Met Thr Asn Val His Gly Pro
545 550 555 560

Tyr Cys Glu Leu Ile Glu Glu Ala Lys Ala Ser Thr Asn Asn Gly Leu
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gcagcagcaa ttgcgctggc taacaaggta ttcaactcac caacacatcg accgaacgtc 480

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gttgcgaccg cattcaagga ctttggaggt attataataa caatagaata cactcaatac 600

gataacattc aagtgccaat tttgaagaaa attgctagcg aaggatacaa tattagaagc 660

aatgacgaag atttcagtgt cagaacgtta acgaacatgt tgttgcaggc aaattgtttc 720

tgtccagacc attacgttcc atttcgtgta aataaccctg aatttggttg tttcgtaact 780

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Met Lys Tyr Gln Cys Val Gly Arg Val Ser Asp Ile Trp Ala Asp Val
35 40 45

Leu Phe Leu Ile Glu Ser Ser Asp Met Ile Thr Lys Ser Gly Phe Arg
50 55 60

Gln Val Ile Ala Phe Ile Thr Ala Thr Thr Lys Lys Met Thr Ile Gly
65 70 75 80

Gln Asp Glu Lys Gln Thr Arg Val Gly Phe Ile Thr Tyr Gly Glu Glu
85 90 95

Ala Lys Leu Ile Tyr Asp Leu Asp His Trp Arg Ser Thr Glu Lys Leu
100 105 110

Ser Asp Leu Val Gln Lys Ile Pro Tyr Val Lys Ser Ser Gly Thr Asn
115 120 125

Ile Ala Ala Ala Ile Ala Leu Ala Asn Lys Val Phe Asn Ser Pro Thr
130 135 140

His Arg Pro Asn Val Pro Lys Val Met Val Ile Val Ala Asn Gly Leu
145 150 155 160

Lys Lys Gly Ser Gln Asn Pro Ile Pro Val Ala Thr Ala Phe Lys Asp
165 170 175

Phe Gly Gly Ile Ile Ile Thr Ile Glu Tyr Thr Gln Tyr Asp Asn Ile
180 185 190

Gln Val Pro Ile Leu Lys Lys Ile Ala Ser Glu Gly Tyr Asn Ile Arg
195 200 205

Ser Asn Asp Glu Asp Phe Ser Val Arg Thr Leu Thr Asn Met Leu Leu
210 215 220

Gln Ala Asn Cys Phe Cys Pro Asp His Tyr Val Pro Phe Arg Val Asn
225 230 235 240

Asn Pro Glu Phe Gly Cys Phe Val Thr Ala Lys Ile Pro Ser Met Trp
245 250 255

Arg Asp Ala Ala Glu Met Cys Arg Ala Val Glu Glu Gly Lys Leu Val
260 265 270

Lys Val Glu Asn Glu Glu Lys Ala Ala Phe Ile Met Lys Leu Val Gly
275 280 285

Pro Lys Lys Glu Ala Trp Ile Gly Leu Arg Tyr Tyr Gly Asn Lys Phe
290 295 300

Gln Trp Thr Asp Gly Thr Lys Leu Asn Ala Asp Asp Phe Asn Leu Trp
305 310 315 320

Pro Glu Asp Ile Lys Glu Leu Asn Gly Pro His Cys Val Ser Met Tyr
325 330 335

Gln Asp Gln Lys Asp Lys Lys Tyr Tyr Trp Arg Ala Gly Lys Cys Leu
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Glu Asp Met Arg Tyr Val Cys Glu Val Gln Pro Cys Ser Ala Ser Asn
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<213> Necator americanus

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35 40 45

Gly Ser Trp Glu Asp Tyr Gln Lys Gln Arg Tyr His Tyr Arg Lys Lys
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Ile Leu Ala Lys Tyr Ala Ala Asn Lys Ala Ser Lys Leu Gln Ser Ala
65 70 75 80

Asn Glu Ile Asp Glu Leu Leu Arg Asn Tyr Met Asp Ala Gln Tyr Tyr
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Gly Val Ile Gln Ile Gly Thr Pro Ala Gln Asn Phe Thr Val Ile Phe
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Asp Thr Gly Ser Ser Asn Leu Trp Val Pro Ser Arg Lys Cys Pro Phe
115 120 125

Tyr Asp Ile Ala Cys Met Leu His His Arg Tyr Asp Ser Gly Ala Ser
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Ser Thr Tyr Lys Glu Asp Gly Arg Lys Met Ala Ile Gln Tyr Gly Thr
145 150 155 160

Gly Ser Met Lys Gly Phe Ile Ser Lys Asp Ile Val Cys Ile Ala Gly
165 170 175

Ile Cys Ala Glu Glu Gln Pro Phe Ala Glu Ala Thr Ser Glu Pro Gly
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Leu Thr Phe Ile Ala Ala Lys Phe Asp Gly Ile Leu Gly Met Ala Phe
195 200 205

Pro Glu Ile Ala Val Leu Gly Val Thr Pro Val Phe His Thr Phe Ile
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Glu Gln Lys Lys Val Pro Ser Pro Val Phe Ala Phe Trp Leu Asn Arg
225 230 235 240

Asn Pro Glu Ser Glu Ile Gly Gly Glu Ile Thr Phe Gly Gly Val Asp
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Thr Arg Arg Tyr Val Glu Pro Ile Thr Trp Thr Pro Val Thr Arg Arg
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Gly Tyr Trp Gln Phe Lys Met Asp Met Val Gln Gly Gly Ser Ser Ser
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305 310 315 320

Gly Ala Glu Pro Leu Met Lys Gly Glu Tyr Met Ile Pro Cys Asp Lys
325 330 335

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385 390 395 400

Val Phe Asp Val Gly Gln Ala Arg Val Gly Phe Ala Gln Ala Lys Ser
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<212> DNA
<213> Necator americanus

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aaattgctca ataaagtttt ttgactaaaa aaaaaaaaaa aaaaaa 1366

<210> 10
<211> 425
<212> PRT
<213> Necator americanus

<400> 10

Met Arg Ser Ile Leu Val Leu Val Ala Leu Ile Gly Cys Ile Ala Ala
1 5 10 15

Gly Val Tyr Lys Ile Pro Leu Lys Arg Ile Thr Pro Pro Met Ile Lys
20 25 30

Met Leu Arg Ala Gly Thr Trp Glu Thr Tyr Val Glu Gly Met Arg Lys
35 40 45

Arg Gln Leu Gln Leu Leu Lys Glu His Lys Val His Ile Gln Asp Val
50 55 60

Leu Gly Tyr Ala Asn Met Glu Tyr Leu Gly Glu Ile Thr Ile Gly Thr
65 70 75 80

Pro Gln Gln Lys Phe Leu Val Val Leu Asp Thr Gly Ser Ser Asn Leu
85 90 95

Trp Val Pro Asp Asp Ser Cys Tyr Lys Glu Lys Arg Pro Asp Arg Cys
100 105 110

Leu Val Ser Asn Cys Asp Ala Gly Leu Val Cys Gln Val Phe Cys Pro
115 120 125

Asp Pro Lys Cys Cys Glu His Thr Arg Glu Phe Lys Gln Val Asn Ala
130 135 140

Cys Lys Asp Lys His Arg Phe Asp Gln Lys Asn Ser Asn Thr Tyr Val
145 150 155 160

Lys Thr Asn Lys Thr Trp Ala Ile Ala Tyr Gly Thr Gly Asp Ala Arg
165 170 175

Gly Phe Phe Gly Arg Asp Thr Val Arg Leu Gly Ala Glu Gly Lys Asp
180 185 190

Gln Leu Val Ile Asn Asp Thr Trp Phe Gly Gln Ala Glu His Ile Ala
195 200 205

Glu Phe Phe Ser Asn Thr Phe Leu Asp Gly Ile Leu Gly Leu Ala Phe
210 215 220

Gln Glu Leu Ser Glu Gly Gly Val Ala Pro Pro Ile Ile Arg Ala Ile
225 230 235 240

Asp Leu Gly Leu Leu Asp Gln Pro Ile Phe Thr Val Tyr Phe Glu Asn
245 250 255

Val Gly Asp Lys Glu Gly Val Tyr Gly Gly Val Phe Thr Trp Gly Gly
260 265 270

Leu Asp Pro Asp His Cys Glu Asp Glu Val Thr Tyr Glu Gln Leu Thr
275 280 285

Glu Ala Thr Tyr Trp Gln Phe Arg Leu Lys Gly Val Ser Ser Lys Asn
290 295 300

Phe Ser Ser Thr Ala Gly Trp Glu Ala Ile Ser Asp Thr Gly Thr Ser
305 310 315 320

Leu Asn Gly Ala Pro Arg Gly Ile Leu Arg Ser Ile Ala Arg Gln Tyr
325 330 335

Asn Gly Gln Tyr Val Ala Ser Gln Gly Leu Tyr Val Val Asp Cys Ser
340 345 350

Lys Asn Val Thr Val Asp Val Thr Ile Gly Asp Arg Asn Tyr Thr Met
355 360 365

Thr Ala Lys Asn Leu Val Leu Glu Ile Gln Ala Asp Ile Cys Ile Met
370 375 380

Ala Phe Phe Glu Met Asp Met Phe Ile Gly Pro Ala Trp Ile Leu Gly
385 390 395 400

Asp Pro Phe Ile Arg Glu Tyr Cys Asn Ile His Asp Ile Glu Lys Lys
405 410 415

Arg Ile Gly Phe Ala Ala Val Lys His
420 425

<210> 11
<211> 509
<212> DNA
<213> Ancylostoma caninum

<400> 11
agcatatcag catgagagtc gctattgttt tcattgcatg cttcgcagta gcacacgcat 60

gcaagtgcga aaagaaacct cgtcctccat tggagaaact gctttgccaa tcacaatttg 120

ttactcacgc gaaagtgacg aagaagagaa ttgatggtta cttcatctat tacgacttgg 180

agcataatta agtttataag cccaaagata ggagtatccc aatcgaactc ttctcatgga 240

gggaaaagga aaattgtggt gttccggatc tcgaagaagg caaagaatac ctgataggag 300

gtaaagtgac ggattatggc gacggtgatt tggtaatttc tgtttcacgg tgcgaccttc 360

tccgaaactg gacagacgtc tctggagagg agaagaaatt gctcggaacg ttcaaatgtg 420

aaaatcagtc ataaacgccg attatatata attgaaagaa gagaaatgaa catttttcac 480

gcgaaaaaaa aaaaaaaaaa aaaaaaaaa 509

<210> 12
<211> 140
<212> PRT
<213> Ancylostoma caninum

<400> 12

Met Arg Val Ala Ile Val Phe Ile Ala Cys Phe Ala Val Ala His Ala
1 5 10 15

Cys Lys Cys Glu Lys Lys Pro Arg Pro Pro Leu Glu Lys Leu Leu Cys
20 25 30

Gln Ser Gln Phe Val Thr His Ala Lys Val Thr Lys Lys Arg Ile Asp
35 40 45

Gly Tyr Phe Ile Tyr Tyr Asp Leu Glu His Lys Glu Val Tyr Lys Pro

50 55 60

Lys Asp Arg Ser Ile Pro Ile Glu Leu Phe Ser Trp Arg Glu Lys Glu
65 70 75 80

Asn Cys Gly Met Pro Asp Leu Glu Glu Gly Lys Glu Tyr Leu Ile Gly
85 90 95

Gly Lys Val Thr Asp Tyr Gly Asp Gly Asp Leu Val Ile Ser Val Ser
100 105 110

Arg Cys Asp Leu Leu Arg Asn Trp Thr Asp Val Ser Gly Glu Glu Lys
115 120 125

Lys Leu Leu Gly Thr Phe Lys Cys Glu Asn Gln Ser
130 135 140

<210> 13
<211> 2615
<212> DNA
<213> Ancylostoma caninum

<400> 13
gtggttttca acgtcctcac atggcttaaa ttaaacgaga acaaagatga ctcatcaccg 60

gctccgaaga tatggaatgt gggagagcaa gataatacac ccgtgctgac aaatttgtta 120

gttttggaaa aagaggagtt agcagcaaag ttgaagaaaa caccatatga ggaggtggat 180

gagcaaacag ttagacaatc gtcggttatg aaactcagga atatcaaaaa tgccctgttc 240

actccaatag aaccagtagc ctcagcgttg cctccattgc gtgtgaatga cccgaaatat 300

tgtccgagtt acggtgaacc ggataagaaa tatgcctatc aggaagcagc atcttatctt 360

ctcagtggtc tggatcagac tgtagatcca tgcgaggatc tctatgcatt cacctgtaat 420

acgtacctca gaaatcacaa cgccaccgac attggcgtga accgaatcgg aacgtacaaa 480

gacgctcaag atgacgtgaa cgctgaaatc gtggaagcac tcgaagaagt taacgtgagc 540

gacacaaagt ggtcggagac ggagaggctt gtgaaagcga ctctcttcac atgtgtacac 600

cacactcgag cgaggaaacc catagacaat tcgaagaacg ttcttataga gatgagagac 660

ttgtttggcg gaattccatt cctcaatcat actctgaaga aggacattga tttctttgat 720

ataatgggaa agttcgagca gaatcatgcg atgggaaccc ttctcggagc aatggtctcg 780

gtcgatttca agaatgtgaa caaacactcc ttattcttat cgcagcccta tcttccaatg 840

gctcgagatt tctatgtttt cccacaacac acaaagatgg ttgagaatcg cgtaagtctc 900

atcaactctg tgctgaggtc gttcgcagag gctgttctgg atgatccctc gccgtatctc 960

gatctgatgt caagatcggc aagagatgta gtgaagctgg agatgcagat tgcgatggca 1020

tcgtggccag agagtgaact gaggaactac gcacaacagc acaatccacg cactttgaat 1080

cagttgaaag cagcgtatcc agcgattaaa tgggacagtt atttcaatgc tctgctctcc 1140

tctgtgcagg gagtcgatat gaataggcag aacatcatac ttacccaacc atcgtacttc 1200

ggctggttaa atgctctctt caacggtggc gcagatgaca aaaccattgc gaattatctt 1260

cttgttcacc tgattctcga ggaggctgat ttccttggtg gagcacttaa aacgatggtt 1320

caaaaatctg attatgttcc atatgcctta ggaagaggaa agggagtcac aagagttggc 1380

cagcaactta ctcgatcaca tgacgatact gttgaggatg caaacataca gtgcttgaac 1440

agcatgatga cgtatatgcc atttggacca ggttacgtgt acgtgaaatc aaggaagaac 1500

agagatgacg ttgtcaagga catagagcac cagaccgagc tggtcttcaa gaactttgtg 1560

aacatgattg gtaacttaaa ttggatgaca gacgcatctc tggagctcgc catggagaaa 1620

gctgatacga tggtgaaaaa ctatggatgg cccaaggatt tgtttggaaa tttcagggat 1680

agtagcaaga ttgatgctta tcacaagaag gattatggta acatcattaa cctgtacaag 1740

gagaacatta ctcataacta ctaccacatc cgcagaacta tgatcaaagg ctattccaac 1800

catgaatcgc tgcgattgct gactgaagcg ccgaaaaggg accacttcct gttgtcaccc 1860

gctctggtga atgcgtggta cataccggag agaaactcca tcgcattccc ttacgccttc 1920

tggaatccac cctattacaa ttacgaatat cctcaagcat gcaactacgc tggtcaaggt 1980

ggaactgctg gccacgaatt agtgcatgga ttcgatgacc agggagtaca gttcgctgcc 2040

gacggaagcc ttagcgactg cacgtggatc gagtgtggat ggttggaaga gaagtccaag 2100

aaaggattca gtgatatggc acaatgtgtt gtcacacagt atagcaccca atgctgccct 2160

cagacaggtg gcgtcaccca ctgcgctaat ggagcgacca cccaaggaga aaacatcgcc 2220

gatcttggag gtcaactggc agcatatcga gcctaccgtg aatacatcac caaggaaaga 2280

ggagaggagg agaagagact gccgggattg gagcagtaca caccaaatca gatcttctgg 2340

ataacatacg gatattcgtg gtgcatgagc caaacagata gcagtcttat tagacaactc 2400

ttgaccgatg ttcactcacc tggctcatgc cgtgttaacc aagtcatgca agatattccg 2460

gaatttgcac tcgatttcgg atgtacaatg ggccagaaga tgtatccaga gcctgagcaa 2520

cgatgtccgg tttgggtagc agaataaatg ttcgaaaatg gaccgtcaga tctcatgttt 2580

tcacgtgaat atgacgctct taactgaggt ttttc 2615

<210> 14
<211> 869
<212> PRT
<213> Ancylostoma caninum

<400> 14

Met Ala Lys Leu Leu Glu Val Thr Thr Gly Leu Val Val Leu Leu Gly
1 5 10 15

Val Leu Gly Val Ile Ser Val Val Phe Asn Val Leu Thr Trp Leu Lys
20 25 30

Leu Asn Glu Asn Lys Asp Asp Ser Ser Pro Ala Pro Lys Ile Trp Asn
35 40 45

Val Gly Glu Gln Asp Asn Thr Pro Val Leu Thr Asn Leu Leu Val Leu
50 55 60

Glu Lys Glu Glu Leu Ala Ala Lys Leu Lys Lys Thr Pro Tyr Glu Glu
65 70 75 80

Val Asp Glu Gln Thr Val Arg Gln Ser Ser Val Met Lys Leu Arg Asn
85 90 95

Ile Lys Asn Ala Leu Phe Thr Ile Glu Pro Val Ala Ser Ala Leu Pro
100 105 110

Pro Leu Arg Val Asn Asp Pro Lys Tyr Cys Pro Ser Tyr Gly Glu Pro
115 120 125

Asp Lys Lys Tyr Ala Tyr Gln Glu Ala Ala Ser Tyr Leu Leu Ser Gly
130 135 140

Leu Asp Gln Thr Val Asp Pro Cys Glu Asp Leu Tyr Ala Phe Thr Cys
145 150 155 160

Asn Thr Tyr Leu Arg Asn His Asn Ala Thr Asp Ile Gly Val Asn Arg
165 170 175

Ile Gly Thr Tyr Lys Asp Ala Gln Asp Asp Val Asn Ala Glu Ile Val
180 185 190

Glu Ala Leu Glu Glu Val Asn Val Ser Asp Thr Lys Trp Ser Glu Thr
195 200 205

Glu Arg Leu Val Lys Ala Thr Leu Phe Thr Cys Val His His Thr Arg
210 215 220

Ala Arg Lys Pro Ile Asp Asn Ser Lys Asn Val Leu Ile Glu Met Arg
225 230 235 240

Asp Leu Phe Gly Gly Ile Pro Phe Leu Asn His Thr Leu Lys Lys Asp
245 250 255

Ile Asp Phe Phe Asp Ile Met Gly Lys Phe Glu Gln Asn His Ala Met
260 265 270

Gly Thr Leu Leu Gly Ala Met Val Ser Val Asp Phe Lys Asn Val Asn
275 280 285

Lys His Ser Leu Phe Leu Ser Gln Pro Tyr Leu Pro Met Ala Arg Asp
290 295 300

Phe Tyr Val Phe Pro Gln His Thr Lys Met Val Glu Asn Arg Val Ser
305 310 315 320

Leu Ile Asn Ser Val Leu Arg Ser Phe Ala Glu Ala Val Leu Asp Asp
325 330 335

Pro Ser Pro Tyr Leu Asp Leu Met Ser Arg Ser Ala Arg Asp Val Val
340 345 350

Lys Leu Glu Met Gln Ile Ala Met Ala Ser Trp Pro Glu Ser Glu Leu
355 360 365

Arg Asn Tyr Ala Gln Gln His Asn Pro Arg Thr Leu Asn Gln Leu Lys
370 375 380

Ala Ala Tyr Pro Ala Ile Lys Trp Asp Ser Tyr Phe Asn Ala Leu Leu
385 390 395 400

Ser Ser Val Gln Gly Val Asp Met Asn Arg Gln Asn Ile Ile Leu Thr
405 410 415

Gln Pro Ser Tyr Phe Gly Trp Leu Asn Ala Leu Phe Asn Gly Gly Ala
420 425 430

Asp Asp Lys Thr Ile Ala Asn Tyr Leu Leu Val His Leu Ile Leu Glu
435 440 445

Glu Ala Asp Phe Leu Gly Gly Ala Leu Lys Thr Met Val Gln Lys Ser
450 455 460

Asp Tyr Val Pro Tyr Ala Leu Gly Arg Gly Lys Gly Val Thr Arg Val
465 470 475 480

Gly Gln Gln Leu Thr Arg Ser His Asp Asp Thr Val Glu Asp Ala Asn
485 490 495

Ile Gln Cys Leu Asn Ser Met Met Thr Tyr Met Pro Phe Gly Pro Gly
500 505 510

Tyr Val Tyr Val Lys Ser Arg Lys Asn Arg Asp Asp Val Val Lys Asp
515 520 525

Ile Glu His Gln Thr Glu Leu Val Phe Lys Asn Phe Val Asn Met Ile
530 535 540

Gly Asn Leu Asn Trp Met Thr Asp Ala Ser Leu Glu Leu Ala Met Glu
545 550 555 560

Lys Ala Asp Thr Met Val Lys Asn Tyr Gly Trp Pro Lys Asp Leu Phe
565 570 575

Gly Asn Phe Arg Asp Ser Ser Lys Ile Asp Ala Tyr His Lys Lys Asp

580 585 590

Tyr Gly Asn Ile Ile Asn Leu Tyr Lys Glu Asn Ile Thr His Asn Tyr
595 600 605

Tyr His Ile Arg Arg Thr Met Ile Lys Gly Tyr Ser Asn His Glu Ser
610 615 620

Leu Arg Leu Leu Thr Glu Ala Pro Lys Arg Asp His Phe Leu Leu Ser
625 630 635 640

Pro Ala Leu Val Asn Ala Trp Tyr Ile Pro Glu Arg Asn Ser Ile Ala
645 650 655

Phe Pro Tyr Ala Phe Trp Asn Pro Pro Tyr Tyr Asn Tyr Glu Tyr Pro
660 665 670

Gln Ala Cys Asn Tyr Ala Gly Gln Gly Gly Thr Ala Gly His Glu Leu
675 680 685

Val His Gly Phe Asp Asp Gln Gly Val Gln Phe Ala Ala Asp Gly Ser
690 695 700

Leu Ser Asp Cys Thr Trp Ile Glu Cys Gly Trp Leu Glu Glu Lys Ser
705 710 715 720

Lys Lys Gly Phe Ser Asp Met Ala Gln Cys Val Val Thr Gln Tyr Ser
725 730 735

Thr Gln Cys Cys Pro Gln Thr Gly Gly Val Thr His Cys Ala Asn Gly
740 745 750

Ala Thr Thr Gln Gly Glu Asn Ile Ala Asp Leu Gly Gly Gln Leu Ala
755 760 765

Ala Tyr Arg Ala Tyr Arg Glu Tyr Ile Thr Lys Glu Arg Gly Glu Glu
770 775 780

Glu Lys Arg Leu Pro Gly Leu Glu Gln Tyr Thr Pro Asn Gln Ile Phe
785 790 795 800

Trp Ile Thr Tyr Gly Tyr Ser Trp Cys Met Ser Gln Thr Asp Ser Ser
805 810 815

Leu Ile Arg Gln Leu Leu Thr Asp Val His Ser Pro Gly Ser Cys Arg
820 825 830

Val Asn Gln Val Met Gln Asp Ile Pro Glu Phe Ala Leu Asp Phe Gly
835 840 845

Cys Thr Met Gly Gln Lys Met Tyr Pro Glu Pro Glu Gln Arg Cys Pro
850 855 860

Val Trp Val Ala Glu
865

<210> 15
<211> 1722
<212> DNA
<213> Ancylostoma caninum

<400> 15
gggtttaatt acccaagttt gaggatgagg gtactcctgt tactgctact tttatccatt 60

tgcgcgagcg ctggctttct agacactaaa ttcggccaga agataaagaa aactcttgac 120

aagattaaag ctgtgcttaa cggcactgca ctcatcgcga ttcgtgaaaa attcattcga 180

ctaagggaaa aaataaaagc aaagctgacg ctctctccag cacgaaaggc tatattggac 240

gaagttatga agcatatcaa aatgatcaaa aaggataaga ttcaagagaa gggcgactca 300

atcgatgaaa tcaatgaaaa gagtgcaatc ggacagttgc tgtaccaggg tgacatcgtt 360

ctgacagaaa agcaagccca gcaaattacc gaagacattg aaaatgacaa aggcgaccgc 420

gaaaaacgac aggcgttccg tgatcgcaat tatccgcgaa cattatggtc gaagggagtg 480

tactttcact ttcataggaa cgcaactcct gaagttagaa gcgtttttgt gaaaggcgca 540

aaactttgga tgaaggatac ttgcatcgac ttcttcgaaa gcaactcagc gcctgatagg 600

attcgtgtgt tcaaagagaa cggatgttgg tcgtacgttg gtaggctggg cggtgaacaa 660

gatctgtcac tgggagaagg ttgtcaatcg gttggcacag ctgcgcacga aattggccac 720

gctattggct tctaccacac tcacgcaaga catgatcgcg ataactttat tacattcaac 780

gcacaaaatg tcaagcccga ttggttggac caattcactc ttcagactcc ggcaacgaat 840

gagaactatg gaataactta cgactatgga agtatcatgc attatggtgc aaatagcgcc 900

tcgcagaacg gacgtcctac aatggttccg catgatccca aatacgtaga aactcttgga 960

tcacccataa tttccttcta tgagcttctc atgatcaaca aacactacga ctgcactaag 1020

aactgtgacc cggctacttc tgcgcagtgt aagatgggtg gcttcccaca tcctcgggat 1080

tgtacaagat gcatttgccc tagtggatat ggaggcaaac tgtgcgacca gaagccagcc 1140

ggatgcggat ctatatacca ggccaccaat cagtaccaga ccttgcacga cgaaattgga 1200

gacaagagag cgggacagag acctagagaa gacatggact tctgctatta ttggatcacg 1260

gccccaaaag gttcaaaaat cgaaatcaaa attgctggat tatcacaagg agccgctgtt 1320

gaaggatgcc agtactgggg agtagaaatc aagactcatg ccgatcaacg tcttaccggc 1380

tacaggttct gcgcaccaga agatgttgga gttagattag tgtcgaactt caacatcgta 1440

ccaataatca catacaacat attctacgcg acctatgtcg atattcagta ccgtatcgtt 1500

ggtgataatg ttggcggtcc tatgcctcag ccacaaccaa atagcaattg tgtcgacaat 1560

gaacagtgtg cgacactcgt gagaacaaag aacttctgtc agagcagatt tttcacagag 1620

tccgtcaaaa gaggtctatg tccaaagtcc agcggtttct gtcgctaact tttcagcaaa 1680

caatggaata aatgttgcac cataaaaaaa aaaaataaaa aa 1722

<210> 16
<211> 536
<212> PRT
<213> Ancylostoma caninum

<400> 16

Met Arg Val Leu Leu Leu Leu Leu Leu Leu Ser Ile Cys Ala Ser Ala
1 5 10 15

Gly Phe Leu Asp Thr Lys Phe Gly Gln Lys Ile Lys Lys Thr Leu Asp
20 25 30

Lys Ile Lys Ala Val Leu Asn Gly Thr Ala Leu Ile Ala Ile Arg Glu
35 40 45

Lys Phe Ile Arg Leu Arg Glu Lys Ile Lys Ala Lys Leu Thr Leu Ser
50 55 60

Pro Ala Arg Lys Ala Ile Leu Asp Glu Val Met Lys His Ile Lys Met
65 70 75 80

Ile Lys Lys Asp Lys Ile Gln Glu Lys Gly Asp Ser Ile Asp Glu Ile
85 90 95

Asn Glu Lys Ser Ala Ile Gly Gln Leu Leu Tyr Gln Gly Asp Ile Val
100 105 110

Leu Thr Glu Lys Gln Ala Gln Gln Ile Thr Glu Asp Ile Glu Asn Asp
115 120 125

Lys Gly Asp Arg Glu Lys Arg Gln Ala Phe Arg Asp Arg Asn Tyr Pro

130 135 140

Arg Thr Leu Trp Ser Lys Gly Val Tyr Phe His Phe His Arg Asn Ala
145 150 155 160

Thr Pro Glu Val Arg Ser Val Phe Val Lys Gly Ala Lys Leu Trp Met
165 170 175

Lys Asp Thr Cys Ile Asp Phe Phe Glu Ser Asn Ser Ala Pro Asp Arg
180 185 190

Ile Arg Val Phe Lys Glu Asn Gly Cys Trp Ser Tyr Val Gly Arg Leu
195 200 205

Gly Gly Glu Gln Asp Leu Ser Leu Gly Glu Gly Cys Gln Ser Val Gly
210 215 220

Thr Ala Ala His Glu Ile Gly His Ala Ile Gly Phe Tyr His Thr His
225 230 235 240

Ala Arg His Asp Arg Asp Asn Phe Ile Thr Phe Asn Ala Gln Asn Val
245 250 255

Lys Pro Asp Trp Leu Asp Gln Phe Thr Leu Gln Thr Pro Ala Thr Asn
260 265 270

Glu Asn Tyr Gly Ile Thr Tyr Asp Tyr Gly Ser Ile Met His Tyr Gly
275 280 285

Ala Asn Ser Ala Ser Gln Asn Gly Arg Pro Thr Met Val Pro His Asp
290 295 300

Pro Lys Tyr Val Glu Thr Leu Gly Ile Asn Lys His Tyr Asp Cys Thr
305 310 315 320

Lys Asn Cys Asp Pro Ala Thr Ser Ala Gln Cys Lys Met Gly Gly Phe
325 330 335

Pro His Pro Arg Asp Cys Thr Arg Cys Ile Cys Pro Ser Gly Tyr Gly
340 345 350

Gly Lys Leu Cys Asp Gln Lys Pro Ala Gly Cys Gly Ser Ile Tyr Gln
355 360 365

Ala Thr Asn Gln Tyr Gln Thr Leu His Asp Glu Ile Gly Asp Lys Arg
370 375 380

Ala Gly Gln Arg Pro Arg Glu Asp Met Asp Phe Cys Tyr Tyr Trp Ile
385 390 395 400

Thr Ala Pro Lys Gly Ser Lys Ile Glu Ile Lys Ile Ala Gly Leu Ser
405 410 415

Gln Gly Ala Ala Val Glu Gly Cys Gln Tyr Trp Gly Val Glu Ile Lys
420 425 430

Thr His Ala Asp Gln Arg Leu Thr Gly Tyr Arg Phe Cys Ala Pro Glu
435 440 445

Asp Val Gly Val Arg Leu Val Ser Asn Phe Asn Ile Val Pro Ile Ile
450 455 460

Thr Tyr Asn Ile Phe Tyr Ala Thr Tyr Val Asp Ile Gln Tyr Arg Ile
465 470 475 480

Val Gly Asp Asn Val Gly Gly Pro Met Pro Gln Pro Gln Pro Asn Ser
485 490 495

Asn Cys Val Asp Asn Glu Gln Cys Ala Thr Leu Val Arg Thr Lys Asn
500 505 510

Phe Cys Gln Ser Arg Phe Phe Thr Ser Ser Val Lys Arg Gly Leu Cys
515 520 525

Pro Lys Ser Ser Gly Phe Cys Arg
530 535

<210> 17
<211> 1328
<212> DNA
<213> Ancylostoma caninum

<400> 17
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gcaagagacg gcttcggctg ttcaaacagt gggataactg acaaggaccg gcaagcattc 120

ctcgacttcc acaacaatgc tcgtcgacgg gttgcgaaag gcgttgagga tagcaactcc 180

ggcaaactga atccagcgaa gaacatgtac aagctgtcat gggactgtgc aatggaacag 240

cagcttcagg atgccattca gtcatgccca agcgcgttcg ctggaattca aggtgttgcg 300

cagaatgtaa tgagctggtc aagctctggt ggattccccg atccatcggt aaagatagaa 360

caaacgctct ccggctggtg gagtggtgct aaaaagaacg gcgtcggccc ggacaacaaa 420

tacaacggtg gcggtctctt cgccttctct aacatggtat actccgaaac gacgaaactt 480

ggctgcgcct acaaggtttg cggcactaaa ctggcggttt cgtgcatcta taatggagtc 540

gggtacatca caaatcaacc tatgtgggag acaggtcagg cttgcaagac aggagcagac 600

tgctccactt acaagaactc aggctgcgag gatggccttt gcacgaaagg accagacgta 660

ccagaaacaa accagcagtg cccctcaaac actggaatga ctgattcagt cagagatact 720

ttcctatcgg tgcacaatga gttcaggtcg agtgttgccc gaggtctgga acccgacgct 780

ctgggcggaa atgcaccaaa agcagctaaa atgctcaaga tggtgtatga ctgtgaagta 840

gaagcatcgg ccatcagaca tggaaataaa tgcgtctatc aacattccca tggcgaagac 900

agacctggac taggagaaaa catctacaag actagtgtac tcaaattcga taagaacaaa 960

gcagccaagc aggcttcaca actctggtgg aatgagttaa aagagttcgg cgtcggccca 1020

tccaacgtcc ttaccactgc tttatggaat agacccggca tgcagattgg tcactacacc 1080

cagatggcat gggacaccac ctacaaactt ggatgtgcag ttgttttctg caatgatttc 1140

acattcggtg tttgtcagta tgggccagga ggcaattaca tgggtcatgt catctacact 1200

atgggccagc cgtgttctca gtgttcgcct ggtgctactt gcagcgtgac cgaaggcttg 1260

tgcagtgctc cttaatcagt tcttaacaat gaatatctta cagttgaaaa aaaaaaaaaa 1320

aaaaaaaa 1328

<210> 18
<211> 424
<212> PRT
<213> Ancylostoma caninum

<400> 18

Met Phe Ser Pro Val Ile Val Ser Val Ile Phe Thr Ile Ala Phe Cys
1 5 10 15

Asp Ala Ser Pro Ala Arg Asp Gly Phe Gly Cys Ser Asn Ser Gly Ile
20 25 30

Thr Asp Lys Asp Arg Gln Ala Phe Leu Asp Phe His Asn Asn Ala Arg
35 40 45

Arg Arg Val Ala Lys Gly Val Glu Asp Ser Asn Ser Gly Lys Leu Asn
50 55 60

Pro Ala Lys Asn Met Tyr Lys Leu Ser Trp Asp Cys Ala Met Glu Gln

65 70 75 80

Gln Leu Gln Asp Ala Ile Gln Ser Cys Pro Ser Ala Phe Ala Gly Ile
85 90 95

Gln Gly Val Ala Gln Asn Val Met Ser Trp Ser Ser Ser Gly Gly Phe
100 105 110

Pro Asp Pro Ser Val Lys Ile Glu Gln Thr Leu Ser Gly Trp Trp Ser
115 120 125

Gly Ala Lys Lys Asn Gly Val Gly Pro Asp Asn Lys Tyr Asn Gly Gly
130 135 140

Gly Leu Phe Ala Phe Ser Asn Met Val Tyr Ser Glu Thr Thr Lys Leu
145 150 155 160

Gly Cys Ala Tyr Lys Val Cys Gly Thr Lys Leu Ala Val Ser Cys Ile
165 170 175

Tyr Asn Gly Val Gly Tyr Ile Thr Asn Gln Pro Met Trp Glu Thr Gly
180 185 190

Gln Ala Cys Lys Thr Gly Ala Asp Cys Ser Thr Tyr Lys Asn Ser Gly
195 200 205

Cys Glu Asp Gly Leu Cys Thr Lys Gly Pro Asp Val Pro Glu Thr Asn
210 215 220

Gln Gln Cys Pro Ser Asn Thr Gly Met Thr Asp Ser Val Arg Asp Thr
225 230 235 240

Phe Leu Ser Val His Asn Glu Phe Arg Ser Ser Val Ala Arg Gly Leu
245 250 255

Glu Pro Asp Ala Leu Gly Gly Asn Ala Pro Lys Ala Ala Lys Met Leu
260 265 270

Lys Met Val Tyr Asp Cys Glu Val Glu Ala Ser Ala Ile Arg His Gly
275 280 285

Asn Lys Cys Val Tyr Gln His Ser His Gly Glu Asp Arg Pro Gly Leu
290 295 300

Gly Glu Asn Ile Tyr Lys Thr Ser Val Leu Lys Phe Asp Lys Asn Lys
305 310 315 320

Ala Ala Lys Gln Ala Ser Gln Leu Trp Trp Asn Glu Leu Lys Glu Phe
325 330 335

Gly Val Gly Pro Ser Asn Val Leu Thr Thr Ala Leu Trp Asn Arg Pro
340 345 350

Gly Met Gln Ile Gly His Tyr Thr Gln Met Ala Trp Asp Thr Thr Tyr
355 360 365

Lys Leu Gly Cys Ala Val Val Phe Cys Asn Asp Phe Thr Phe Gly Val
370 375 380

Cys Gln Tyr Gly Pro Gly Gly Asn Tyr Met Gly His Val Ile Tyr Thr
385 390 395 400

Met Gly Gln Pro Cys Ser Gln Cys Ser Pro Gly Ala Thr Cys Ser Val
405 410 415

Thr Glu Gly Leu Cys Ser Ala Pro
420

<210> 19
<211> 767
<212> DNA
<213> Ancylostoma caninum

<400> 19
cgacacaacc aacgatgtta gttcttgtac cacttttggc tctcttggct gtttctgttc 60

atggaaattc tatgagatgc ggaaataatg gaatgaccga cgaagcccgg cagaaattcc 120

tcgacgtgca caacagttac agatctatgg ttgccaaagg acaggcaaag gatgcaattt 180

cgggaaatgc tccgaaggct gccaaaatga agaaaatgat ctacgactgc aacgtcgaat 240

caactgcaat gcaaaatgcg aaaaaatgtg ttttcgccca ttcgcacagg aagggagttg 300

gcgaaaatat ttggatgtcg actgcgcgtc agatggacaa agcacaagct gctcaacagg 360

ctagtgacgg ttggttcagt gagcttgcga agtatggtgt aggccaggaa aacaagctaa 420

caacgcagtt gtggaacagg ggagttatga taggacatta cactcagatg gtctggcagg 480

agtcctacaa actcggatgt tatgtggaat ggtgttcatc gatgacctat ggtgtctgcc 540

agtacagtcc tcagggtaat atgatgaact cactcatcta cgagaaagga aacccgtgca 600

caaaagactc tgactgtggc tcgaacgcca gttgcagcgc tggggaggcg ctttgcgtcg 660

tgcgtggcta gctggacatt cccaacgtac aacagcgtta tagttaatgc aacttttctt 720

tcatcttatt gagtaaaggc attgaaaaca aaaaaaaaaa aaaaaaa 767

<210> 20
<211> 218
<212> PRT
<213> Ancylostoma caninum

<400> 20

Met Leu Val Leu Val Pro Leu Leu Ala Leu Leu Ala Val Ser Val His
1 5 10 15

Gly Asn Ser Met Arg Cys Gly Asn Asn Gly Met Thr Asp Glu Ala Arg
20 25 30

Gln Lys Phe Leu Asp Val His Asn Ser Tyr Arg Ser Met Val Ala Lys
35 40 45

Gly Gln Ala Lys Asp Ala Ile Ser Gly Asn Ala Pro Lys Ala Ala Lys
50 55 60

Met Lys Lys Met Ile Tyr Asp Cys Asn Val Glu Ser Thr Ala Met Gln
65 70 75 80

Asn Ala Lys Lys Cys Val Phe Ala His Ser His Arg Lys Gly Val Gly
85 90 95

Glu Asn Ile Trp Met Ser Thr Ala Arg Gln Met Asp Lys Ala Gln Ala
100 105 110

Ala Gln Gln Ala Ser Asp Gly Trp Phe Ser Glu Leu Ala Lys Tyr Gly
115 120 125

Val Gly Gln Glu Asn Lys Leu Thr Thr Gln Leu Trp Asn Arg Gly Val
130 135 140

Met Ile Gly His Tyr Thr Gln Met Val Trp Gln Glu Ser Tyr Lys Leu
145 150 155 160

Gly Cys Tyr Val Glu Trp Cys Ser Ser Met Thr Tyr Gly Val Cys Gln
165 170 175

Tyr Ser Pro Gln Gly Asn Asn Met Asn Ser Leu Thr Tyr Glu Lys Gly
180 185 190

Asn Pro Cys Thr Lys Asp Ser Asp Cys Gly Ser Asn Ala Ser Cys Ser

195 200 205

Ala Gly Glu Ala Leu Cys Val Val Arg Gly
210 215

<210> 21
<211> 687
<212> DNA
<213> Ancylostoma caninum

<400> 21
ataagacagc aatgaagtcc tatcttgtga tatcagctgc gatcctcggc attgcttatg 60

ccgatgctga ttattccaag tgcccgcaaa atgaaataat gaacaacgat atgagggaaa 120

aagttacgga catgcacaac gcctacagat ccaaattcgc acgggatcat caagcttcga 180

aaatgagaaa attggtttac gactgtgcca tcgaaaaagg aatctacgag tcggatacca 240

agtgcgagat gaaaccatcg atggaggagg agaacgtaga agttatcgac ggcaacagcg 300

atgatctcac tgttatttca gaggccggta attcgtggtg gagcgagatt ttggacctga 360

aaggaaagga tgtgtacaac tccgtggaca atacatcgga aattgccaat atggcttggg 420

aaagtcatgc gaaacttggt tgcgcagttg ttgagtgctc caagaaaacc catgtagtct 480

gccgatacgg accggaagga aaaggtgaag gaaagaaaat ttacgaaaag ggcgaaacat 540

gctcacaatg cagtgattac ggacaaggtg tcacctgtga caatgacgag tgggagggat 600

tactctgctc ataatattgg aaaaacatat gtggatgatg atgttcgcaa ataaataaat 660

caattacaaa aaaaaaaaaa aaaaaaa 687

<210> 22
<211> 200
<212> PRT
<213> Ancylostoma caninum

<400> 22

Met Lys Ser Tyr Leu Val Ile Ser Ala Ala Ile Leu Gly Ile Ala Tyr
1 5 10 15

Ala Asp Ala Asp Tyr Ser Lys Cys Pro Gln Asn Glu Ile Met Asn Asn
20 25 30

Asp Met Arg Glu Lys Val Thr Asp Met His Asn Ala Tyr Arg Ser Lys
35 40 45

Phe Ala Arg Asp His Gln Ala Ser Lys Met Arg Lys Leu Val Tyr Asp
50 55 60

Cys Ala Ile Glu Lys Gly Ile Tyr Glu Ser Asp Thr Lys Cys Glu Met
65 70 75 80

Lys Pro Ser Met Glu Glu Glu Asn Val Glu Val Ile Asp Gly Asn Ser
85 90 95

Asp Asp Leu Thr Val Ile Ser Glu Ala Gly Asn Ser Trp Trp Ser Glu
100 105 110

Ile Leu Asp Leu Lys Gly Lys Asp Val Tyr Asn Ser Val Asp Asn Thr
115 120 125

Asp Glu Ile Ala Asn Met Ala Trp Glu Ser His Ala Lys Leu Gly Cys
130 135 140

Ala Val Val Glu Cys Ser Lys Lys Thr His Val Val Cys Arg Tyr Gly
145 150 155 160

Pro Glu Gly Lys Gly Glu Gly Lys Lys Ile Tyr Glu Lys Gly Glu Thr
165 170 175

Cys Ser Gln Cys Ser Asp Tyr Gly Gln Gly Val Thr Cys Asp Asn Asp

180 185 190

Glu Trp Glu Gly Leu Leu Cys Ser
195 200

<210> 23
<211> 1689
<212> DNA
<213> Ancylostoma caninum

<400> 23
agaacatgat caacatccat ttcatagcgc ttgccataac ctctcttttg cctgccctat 60

ccgaagggaa accggtcgta tttgttgaac cacagtgtaa gccgaatggt tacctacaca 120

agaatacaat cgacaacaat gttcttaagc cgataaatac tcgtcgagag gctctggcca 180

agggcacgca acagaatggc tttgacccac caaacccaca aacattcttg ccaccagcga 240

cggacatgac taaactgagt tggagttgtg atcttgagca gaaggctata aaaactatca 300

acggtaactg tgtgaatccg gcaaacccaa ccaaaccgaa taacggcgaa ggattggcag 360

atgtcctcta ctacggcaac gactatgata acacggtcga aggagtgatc caaggcaatc 420

tcgaagcttg gctggtaaaa gccgatttca atgtattccc tgttaccaca aaaggtaccg 480

tcattagcta tcccacttac aatggcaaca cagatctctt ggcatactct aacttagtcc 540

ggcctaccaa tactgagata ggatgtgtac tggaaagatg tccagctaca gccaatgttc 600

caaagctagt cacgttctac tgtattttga atggaaaaaa tatcaccaac ggagaggctc 660

tctataaggg cacaactgtg aataccggag gatgcaaaga ggtcacatgc tcagcgggat 720

atgcctgtaa caacgccacc ttgctatgtg aacgtagtgc gacaacaagc tcatctacat 780

cggcaagcac atcttcatca acagcttcct caacaagttc atctatggca ataagcacat 840

cttcgtcaac aagcgcatct ggggcaacaa caacaaaagc tccttctccg caagcgcaat 900

tccccacagg gactagcact atgtgcaata ccaggcatgc ctatgctaac aggatgaccg 960

acaatctcag gaatgaatac gtaaggctgc acaacttccg aagaggctta ctcgcaaagg 1020

gagaaattcc tcagaagggt aacatatacc taccaaaggc ggctgacatg tggaaaatta 1080

gttacgactg cggcctggaa caaggagcca tagaacacgc aagccagtgt ctcacaggag 1140

ggtccggaca aagctcgaga ccaggtgtgg gagagaactt taaagtgatc ccagcggcaa 1200

gatttccgac tttcgaagat gcagcaaaaa agaccgttac tgaatggtgg aagccgattc 1260

gtaacgtgga ctacttcgga aacaacgtca acttcctccc catctatgac caagacccga 1320

tatcctcctt tacccggatg gcatgggcca caactaacaa ggtggggtgc tctatcgtaa 1380

agtgcacaac ggacaacgta tacgtaggcg tgtgccgata tagtccaatg ggtaacattg 1440

tgaacagcaa catctaccaa attgggaatc cctgcagtgt gagacctact caagcgaccg 1500

ggtgtgaccc agtcgaggga ttgtggtact aggcgcactt ttccgcactg aatggcgatt 1560

ctgttttgaa tttttgaata ttacattaat ggatgttaac aatgggtcct ttagttttct 1620

gttgttaaca agggtggtta gattggattg ggaataaatg atgcaatcgc caaaaaaaaa 1680

aaaaaaaaa 1689

<210> 24
<211> 508
<212> PRT
<213> Ancylostoma caninum

<400> 24

Met Ile Asn Ile His Phe Ile Ala Leu Ala Ile Thr Ser Leu Leu Pro
1 5 10 15

Ala Leu Ser Glu Gly Lys Pro Val Val Phe Val Glu Pro Gln Cys Lys
20 25 30

Pro Asn Gly Tyr Leu His Lys Asn Thr Ile Asp Asn Asn Val Leu Lys
35 40 45

Pro Ile Asn Thr Arg Arg Glu Ala Leu Ala Lys Gly Thr Gln Gln Asn
50 55 60

Gly Phe Asp Pro Pro Asn Pro Gln Thr Phe Leu Pro Pro Ala Thr Asp
65 70 75 80

Met Thr Lys Leu Ser Trp Ser Cys Asp Leu Glu Gln Lys Ala Ile Lys
85 90 95

Thr Ile Asn Gly Asn Cys Val Asn Pro Ala Asn Pro Thr Lys Pro Asn
100 105 110

Asn Gly Glu Gly Leu Ala Asp Val Leu Tyr Tyr Gly Asn Asp Tyr Asp
115 120 125

Asn Thr Val Glu Gly Val Ile Gln Gly Asn Leu Glu Ala Trp Leu Val
130 135 140

Lys Ala Asp Phe Asn Val Phe Pro Val Thr Thr Lys Gly Thr Val Ile
145 150 155 160

Ser Tyr Pro Thr Tyr Asn Gly Asn Thr Asp Leu Leu Ala Tyr Ser Asn
165 170 175

Leu Val Arg Pro Thr Asn Thr Glu Ile Gly Cys Val Leu Glu Arg Cys
180 185 190

Pro Ala Thr Ala Asn Val Pro Lys Leu Val Thr Phe Tyr Cys Ile Leu
195 200 205

Asn Gly Lys Asn Ile Thr Asn Gly Arg Ala Leu Tyr Lys Gly Thr Thr
210 215 220

Val Asn Thr Gly Gly Cys Lys Glu Val Thr Cys Ser Ala Gly Tyr Ala
225 230 235 240

Cys Asn Asn Ala Thr Leu Leu Cys Glu Arg Ser Ala Thr Thr Ser Ser
245 250 255

Ser Thr Ser Ala Ser Thr Ser Ser Ser Thr Ala Ser Ser Thr Ser Ser
260 265 270

Ser Asn Ala Ile Ser Thr Ser Ser Ser Thr Ser Ala Ser Gly Ala Thr
275 280 285

Thr Thr Lys Ala Pro Ser Pro Gln Ala Gln Phe Pro Thr Gly Thr Ser
290 295 300

Thr Met Cys Asn Thr Arg His Ala Tyr Ala Asn Arg Met Thr Asp Asn
305 310 315 320

Leu Arg Asn Glu Tyr Val Arg Leu His Asn Phe Arg Arg Gly Leu Leu
325 330 335

Ala Lys Gly Glu Ile Pro Gln Lys Gly Asn Ile Tyr Leu Pro Lys Ala
340 345 350

Ala Asp Met Trp Lys Ile Ser Tyr Asp Cys Gly Leu Glu Gln Gly Ala
355 360 365

Ile Glu His Ala Ser Gln Cys Leu Thr Gly Gly Ser Gly Gln Ser Ser
370 375 380

Arg Pro Gly Val Gly Glu Asn Phe Lys Val Ile Pro Ala Ala Arg Phe
385 390 395 400

Pro Thr Phe Glu Asp Ala Ala Lys Lys Thr Val Thr Glu Trp Trp Lys

405 410 415

Pro Ile Arg Asn Val Asp Tyr Phe Gly Asn Asn Val Asn Phe Leu Pro
420 425 430

Ile Tyr Asp Gln Asp Pro Ile Ser Ser Phe Thr Arg Asn Ala Trp Ala
435 440 445

Thr Thr Asn Lys Val Gly Cys Ser Ile Val Lys Cys Thr Thr Asp Asn
450 455 460

Val Tyr Val Gly Val Cys Arg Tyr Ser Pro Met Gly Asn Ile Val Asn
465 470 475 480

Ser Asn Ile Tyr Gln Ile Gly Asn Pro Cys Ser Val Arg Pro Thr Gln
485 490 495

Ala Thr Gly Cys Asp Pro Val Glu Gly Leu Trp Tyr
500 505

<210> 25
<211> 1384
<212> DNA
<213> Ancylostoma caninum

<400> 25
atactactgc agtgtgcgtt taggagaact ctcactgcat cgaaaatgcc gaatctactc 60

ctgctgctgt ttctctcgct accaggagcg attctttcaa ccacttgtcc aggaaatgat 120

ctaacagatg ctgaacgcac actgctaact agggtgcaca attccattcg acgggaaata 180

gcgcaaggag ttgcaaacaa ctaccatggt ggtaaactgc ctgctggaaa gaacatatac 240

aggatgagat acagctgtga gctggaacag gctgctattg atgctagtca aaccttctgt 300

tccgcatcat tggaggaacc acagaaatat ggacaaaaca tccaagcata cgtcacacca 360

tctataatcg ctcgcccgaa aaacgacctt cttgaagatg cagtgaaaca atggtatctg 420

cctgttatct actacggcca gcgcgacgcg gccaacaagt ttacggatcc gcgcttgtac 480

acatttgcaa acctcgccta cgacaagaac actgcacttg gctgtcacta tgcgaaatgt 540

caaggccctg acagaatcgt cattagttgc atgtacaaca acgtcgttcc tgacaacgca 600

gtgatctacg agcctggaac tgcttgcgta aaagatgcgg actgcactac ttatcctcag 660

tccacatgca aggacagcct ttgcattatt cctacgccac atccaccaaa tccaccaaat 720

ccaccaccag caatgagtcc aaacgctgaa atgactgatg cagcacgaaa gaaggtcctc 780

ggcatgcaca actggcgcag atcgcaggtc gctctgggaa acgttcaaaa cgggaaaaat 840

gcttacaact gccccactgc aacagacatg tacaagatag aatatgattg cgacctcgag 900

aacagcgctc tagcgtatgc aaagcaatgt agtctcgttg gttcagcaga aggaactcgt 960

ccaggagaag gcgagaatgt ccacaaaggc gctctcgtaa ccgatccgga ggctgcagtt 1020

cagaccgcag ttcaagcatg gtggagtcaa atctcacaaa atggactcaa tgcacagatg 1080

aaattcactg ctttcttgaa ggacaagcct gacgctccga cagcgtttac acagatggcg 1140

tgggccaaat ccgtaaagct tggatgtgct gtctctaatt gtcaggcaga taccttcacc 1200

gtctgtagat acaaagctgc cggaaacatc gtgggcgaat tcatctatac caagggaaat 1260

gtatgcgacg cctgtaaagc cacatgcatt accgcggaag gtctttgccc aacgccttga 1320

ttttcactgg actgtttcac gaacagatca gataaatcgt ttcatcaaaa aaaaaaaaaa 1380

aaaa 1384

<210> 26
<211> 424
<212> PRT
<213> Ancylostoma caninum

<400> 26

Met Pro Asn Leu Leu Leu Leu Leu Phe Leu Ser Leu Pro Gly Ala Ile

1 5 10 15

Leu Ser Thr Thr Cys Pro Gly Asn Asp Leu Thr Asp Ala Glu Arg Thr
20 25 30

Leu Leu Thr Arg Val His Asn Ser Ile Arg Arg Glu Ile Ala Gln Gly
35 40 45

Val Ala Asn Asn Tyr His Gly Gly Lys Leu Pro Ala Gly Lys Asn Ile
50 55 60

Tyr Arg Met Arg Tyr Ser Cys Glu Leu Glu Gln Ala Ala Ile Asp Ala
65 70 75 80

Ser Gln Thr Phe Cys Ser Ala Ser Leu Glu Glu Pro Gln Lys Tyr Gly
85 90 95

Gln Asn Ile Gln Ala Tyr Val Thr Pro Ser Ile Ile Ala Arg Pro Lys
100 105 110

Asn Asp Leu Leu Glu Asp Ala Val Lys Gln Trp Tyr Leu Pro Val Ile
115 120 125

Tyr Tyr Gly Gln Arg Asp Ala Ala Asn Lys Phe Thr Asp Pro Arg Leu
130 135 140

Tyr Thr Phe Ala Asn Leu Ala Tyr Asp Lys Asn Thr Ala Leu Gly Cys
145 150 155 160

His Tyr Ala Lys Cys Gln Gly Pro Asp Arg Ile Val Ile Ser Cys Met
165 170 175

Tyr Asn Asn Val Val Pro Asp Asn Ala Val Ile Tyr Glu Pro Gly Thr
180 185 190

Ala Cys Val Lys Asp Ala Asp Cys Thr Thr Tyr Pro Gln Ser Thr Cys
195 200 205

Lys Asp Ser Leu Cys Ile Ile Pro Thr Pro His Pro Pro Asn Pro Pro
210 215 220

Asn Pro Pro Pro Ala Met Ser Pro Asn Ala Glu Met Thr Asp Ala Ala
225 230 235 240

Arg Lys Lys Val Leu Gly Met His Asn Trp Arg Arg Ser Gln Val Ala
245 250 255

Leu Gly Asn Val Gln Asn Gly Lys Asn Ala Tyr Asn Cys Pro Thr Ala
260 265 270

Thr Asp Met Tyr Lys Ile Glu Tyr Asp Cys Asp Leu Glu Asn Ser Ala
275 280 285

Leu Ala Tyr Ala Lys Gln Cys Ser Leu Val Gly Ser Ala Glu Gly Thr
290 295 300

Arg Pro Gly Glu Gly Glu Asn Val His Lys Gly Ala Leu Val Thr Asp
305 310 315 320

Pro Glu Ala Ala Val Gln Thr Ala Val Gln Ala Trp Trp Ser Gln Ile
325 330 335

Ser Gln Asn Gly Leu Asn Ala Gln Met Lys Phe Thr Ala Phe Leu Lys
340 345 350

Asp Lys Pro Asp Ala Pro Thr Ala Phe Thr Gln Met Ala Trp Ala Lys
355 360 365

Ser Val Lys Leu Gly Cys Ala Val Ser Asn Cys Gln Ala Asp Thr Phe
370 375 380

Thr Val Cys Arg Tyr Lys Ala Ala Gly Asn Ile Val Gly Glu Phe Ile
385 390 395 400

Tyr Thr Lys Gly Asn Val Cys Asp Ala Cys Lys Ala Thr Cys Ile Thr
405 410 415

Ala Glu Gly Leu Cys Pro Thr Pro
420

<210> 27
<211> 1467
<212> DNA
<213> Ancylostoma caninum

<400> 27
cagcaatagt ccaatgaagc tcttcattct ggttttggtc gctatccttg gcattgctca 60

cgccactgat tttcaatgct ggaacttcaa atcgacggat acactgcggg aacattacct 120

caaatccatt aacaacctaa ggaagaaaat cgccgatgga tcagcggaaa acaaatcagg 180

aaagtgcccg cagggcaaga atatctacaa gctaagctgg gattgtgaat tggaactgaa 240

agcacagcaa gctgtagacc agtgcaaacc gaatgtaccc gaacccgcag gatattcgca 300

aatactaaag aaggttaaaa gcacctgcga cccaacgaag gtcctgaaga aacagataga 360

agcatggtgg actaagtccg tgaaagatgc tggagttgat aatcctccaa acaacaaaca 420

aggtttggaa gatttcgcaa agttagcaaa tggaaaggct acgaagattg gttgtgcgca 480

gaaaaactgc aacgaacagt tgtacgtggc atgtgttatt aacgaaccgg ctcctgcagt 540

gggtatgcca atctatgagg ttggagctgg atgtaattcc aaagacgatt gtacaacgta 600

tctgcagtcg aagtgcagta acaaagtatg cgtcgccggg cacccaggtg atgccaccac 660

tacaacatca acaccagcaa caacagcacc aacaacaccc acgattcctg ctggaccaac 720

aactgcgcca gctccaccac caacaactgc agctcctaca acgacgagta cgattggttc 780

gattgacaat acgatttgtc cgcaaaacca agtgatcacc gactcagtca ggctcacatt 840

cttgaatacg cacaacggac tcagatctca actcgcgcaa ggtcaaatct ttatgggaaa 900

tggcgctagg gcgcgtccgg catcgaaaat gaggaggatg gtatataact gtgatgcgga 960

atcaagcgct cgcaattcgg ccgctcagtg ccttagcagc cccggttcac ctagcggcta 1020

cactgagaac ttgcatgtta tcaacaacaa ctttgtggac cataacagtg cggctactca 1080

ggcttttaac gcatggtggt cagaaattaa cacaggatat atgcgtcagg cagagacgga 1140

aaggaatatg tactctctga gcgttggaat accaaacttc gctaaaatgg cttgggaaac 1200

caatgcacat cttggttgtg ctatagtcag atgcggtttg aacacgaacg tcgtctgccc 1260

ctactcccca aaatcggatg gaggccaaat ttacaagatg ggccccttt gcagacgttg 1320

ccccgactac cctgggactt tttgcaacca aggactctgc tcattttaag acccgccccg 1380

atatatcttt ggggagataa ttttacgagc aataaaccaa gcgtgaagaa aaaaaaaaaa 1440

aaaaaaaaaa aaaaaaaaaa aaaaaaa 1467

<210> 28
<211> 451
<212> PRT
<213> Ancylostoma caninum

<400> 28

Met Lys Leu Phe Ile Leu Val Leu Val Ala Ile Leu Gly Ile Ala His
1 5 10 15

Ala Thr Asp Phe Gln Cys Trp Asn Phe Lys Ser Thr Asp Thr Leu Arg
20 25 30

Glu His Tyr Leu Lys Ser Ile Asn Asn Leu Arg Lys Lys Ile Ala Asp

35 40 45

Gly Ser Ala Glu Asn Lys Ser Gly Lys Cys Pro Gln Gly Lys Asn Ile
50 55 60

Tyr Lys Leu Ser Trp Asp Cys Glu Leu Glu Leu Lys Ala Gln Gln Ala
65 70 75 80

Val Asp Gln Cys Lys Pro Asn Val Pro Glu Pro Ala Gly Tyr Ser Gln
85 90 95

Ile Leu Lys Lys Val Lys Ser Thr Cys Asp Pro Thr Lys Val Leu Lys
100 105 110

Lys Gln Ile Glu Ala Trp Trp Thr Lys Ser Val Lys Asp Ala Gly Val
115 120 125

Asp Asn Pro Pro Asn Asn Lys Gln Gly Leu Glu Asp Phe Ala Lys Leu
130 135 140

Ala Asn Gly Lys Ala Thr Lys Ile Gly Cys Ala Gln Lys Asn Cys Asn
145 150 155 160

Glu Gln Leu Tyr Val Ala Cys Val Ile Asn Glu Pro Ala Pro Ala Val
165 170 175

Gly Met Pro Ile Tyr Glu Val Gly Ala Gly Cys Asn Ser Lys Asp Asp
180 185 190

Cys Thr Thr Tyr Leu Gln Ser Lys Cys Ser Asn Lys Val Cys Val Ala
195 200 205

Gly His Pro Gly Asp Ala Thr Thr Thr Thr Ser Thr Pro Ala Thr Thr
210 215 220

Ala Pro Thr Thr Pro Thr Ile Pro Ala Gly Pro Thr Thr Ala Pro Ala
225 230 235 240

Pro Pro Pro Thr Thr Ala Ala Pro Thr Thr Thr Ser Thr Ile Gly Ser
245 250 255

Ile Asp Asn Thr Ile Cys Pro Gln Asn Gln Val Ile Thr Asp Ser Val
260 265 270

Arg Leu Thr Phe Leu Asn Thr His Asn Gly Leu Arg Ser Gln Leu Ala
275 280 285

Gln Gly Gln Ile Phe Met Gly Asn Gly Ala Arg Ala Arg Pro Ala Ser
290 295 300

Lys Met Arg Arg Met Val Tyr Asn Cys Asp Ala Glu Ser Ser Ala Arg
305 310 315 320

Asn Ser Ala Ala Gln Cys Leu Ser Ser Pro Gly Ser Pro Ser Gly Tyr
325 330 335

Thr Glu Asn Leu His Val Ile Asn Asn Asn Phe Val Asp His Asn Ser
340 345 350

Ala Ala Thr Gln Ala Phe Asn Ala Trp Trp Ser Glu Ile Asn Thr Gly
355 360 365

Tyr Met Arg Gln Ala Glu Thr Glu Arg Asn Met Tyr Ser Leu Ser Val
370 375 380

Gly Ile Pro Asn Phe Ala Lys Met Ala Trp Glu Thr Asn Ala His Leu
385 390 395 400

Gly Cys Ala Ile Val Arg Cys Gly Leu Asn Thr Asn Val Val Cys Pro
405 410 415

Tyr Ser Pro Lys Ser Asp Gly Gly Gln Ile Tyr Lys Met Gly Pro Phe
420 425 430

Cys Arg Arg Cys Pro Asp Tyr Pro Gly Thr Phe Cys Asn Gln Gly Leu
435 440 445

Cys Ser Phe
450

<210> 29
<211> 602
<212> DNA
<213> Ancylostoma caninum

<400> 29
gggtttaatt acccaagttt gagaatgatt caattgtttt tgttagcgct cgtacctatg 60

tgcatctcag tgagggaaca gtcgatagct gttaaaggac gacttttgtg tggcgatcaa 120

ccagctgcga acgtcagagt aaagttatgg gaggaagaca caggaccaga tccagatgac 180

ctactggatg caggatacac gaactccaac ggtgaattcc aactccaagg cggaacaata 240

gagacgactc ctattgaccc cgtcttgaaa atttatcatg attgcaatga cgtgactggt 300

ttcctaagcg tacctaaacc tggcagcaga aaggtgaggt tctccttacc agacaagtac 360

atcagcgatg gaatggttcc taagaaagtt atggacatcg gtgttatcaa tcttgaagtg 420

gaatttgaaa aggaaggacg tgaatttatc gttgactaag tgatcaataa actcatcgct 480

ttctctttct atgtaaacat ttttgttgtg aacaaatcat atggttgtac ataatccgaa 540

ctgttggttt ttcgaatact gcacaaataa agcatttctt ctaaaaaaaa aaaaaaaaaa 600

aa 602

<210> 30
<211> 144
<212> PRT
<213> Ancylostoma caninum

<400> 30

Met Ile Gln Leu Phe Leu Leu Ala Leu Val Pro Met Cys Ile Ser Val
1 5 10 15

Arg Glu Gln Ser Ile Ala Val Lys Gly Arg Leu Leu Cys Gly Asp Gln
20 25 30

Pro Ala Ala Asn Val Arg Val Lys Leu Trp Glu Glu Asp Thr Gly Pro
35 40 45

Asp Pro Asp Asp Leu Leu Asp Ala Gly Tyr Thr Asn Ser Asn Gly Glu
50 55 60

Phe Gln Leu Gln Gly Gly Thr Ile Glu Thr Thr Pro Ile Asp Pro Val
65 70 75 80

Leu Lys Ile Tyr His Asp Cys Asn Asp Val Thr Gly Phe Leu Ser Val
85 90 95

Pro Lys Pro Gly Ser Arg Lys Val Arg Phe Ser Leu Pro Asp Lys Tyr
100 105 110

Ile Ser Asp Gly Met Val Pro Lys Lys Val Met Asp Ile Gly Val Ile
115 120 125

Asn Leu Glu Val Glu Phe Glu Lys Glu Gly Arg Glu Phe Ile Val Asp
130 135 140

<210> 31

<211> 838
<212> DNA
<213> Ancylostoma caninum

<400> 31
cacttccagc gatgttctgt cgtgttactg tcgccgtttt gttgttggcc gtatcggcct 60

atgccggatt tttcgatgac gtcagtggca tggcctcaga tgttgggaat ttcttcacaa 120

accaattcaa caatgtgaag gatttgtttg ctggaaatca atcggaactc gagaagaaca 180

tcaatcgagt aaaggatctt ctgacggccg tcaaagaaaa ggctaagatg cttgaaccaa 240

tggccaatga tgctcagaag aagacgttat cacaggtgga caactacctc aacgaagtgc 300

aacagttcgg tgaacaggta agcaaagaag gctcggcgaa gttcgaggag aacaagggca 360

agtggcagca aatgctgaac gacatcttcg agaagggcgg tctggacggc gtgctgaagc 420

tgctcaatct gaaatctgcc ggccactgca cactcgtagc ggccatcgtc gctccagtag 480

tgctggcgtt cacccgctaa gcgccaccca ctaatcgata attgtagcct gtcacctgcc 540

gtcgatcgat aattgttgtc gcgtgtgcgt atgcttgcat ctatgtatga tgatgtgtat 600

ctatatgtga tttgtattct acttcgccgc attcagctct ggtattctga gacggattat 660

cgcttctcgc acacactcac acacacaaat aacccccgat tatctcccga ttatcacccg 720

gttagtagat gagacataat ttccatccgt ccacatactc tacttctatc tatggtcaat 780

gtggttcttt atgtaaataa acttttccat cgaaaaaaaa aaaaaaaaaa aaaaaaaa 838

<210> 32
<211> 162
<212> PRT
<213> Ancylostoma caninum

<400> 32

Met Phe Cys Arg Val Thr Val Ala Val Leu Leu Leu Ala Val Ser Ala
1 5 10 15

Tyr Ala Gly Phe Phe Asp Asp Val Ser Gly Met Ala Ser Asp Val Gly
20 25 30

Asn Phe Phe Thr Asn Gln Phe Asn Asn Val Lys Asp Leu Phe Ala Gly
35 40 45

Asn Gln Ser Glu Leu Glu Lys Asn Ile Asn Arg Val Lys Asp Leu Leu
50 55 60

Thr Ala Val Lys Glu Lys Ala Lys Met Leu Glu Pro Met Ala Asn Asp
65 70 75 80

Ala Gln Lys Lys Thr Leu Ser Gln Val Asp Asn Tyr Leu Asn Glu Val
85 90 95

Gln Gln Phe Gly Glu Gln Val Ser Lys Glu Gly Ser Ala Lys Phe Glu
100 105 110

Glu Asn Lys Gly Lys Trp Gln Gln Met Leu Asn Asp Ile Phe Glu Lys
115 120 125

Gly Gly Leu Asp Gly Val Leu Lys Leu Leu Asn Leu Lys Ser Ala Gly
130 135 140

His Cys Thr Leu Val Ala Ala Ile Val Ala Pro Val Val Leu Ala Phe
145 150 155 160

Thr Arg

<210> 33
<211> 2043
<212> DNA
<213> Ancylostoma caninum

<400> 33

tcaccgcttc cgaccgatgc ttcaggaaac tacgtcaccg acgaaggaac tgtcattgag 60

aaagacgatg agggaagacc attgggaccg gatggacaag tgttgcccac cgacgaatct 120

ggaaactaca tctatcctgt cgttggaccc gatggaagcc cattgccaac tgacgagcac 180

aagcgaccaa ttcacccagt ccttggacct gatggcagcc cactgccgac agacgaatca 240

ggccatccac taggagaaga cggacagcca cttccaacag atgcttctgg cgttcctgtg 300

gataaggacg gtcagccgtt gccgacagac agcagtggac actacgtcac agttccacgt 360

gaagaagctg tcacgaagga gctaccaacg gacgagagcg gaaatgtcat ctacccagtg 420

acgaaacctg atggatcacc gcttccgacc gatgcttcag gaaactacgt caccgacgaa 480

ggaactgtca ttgagaaaga cgatgaggga agaccattgg gaccggacgg acaagtgttg 540

cccaccgacg aatccggaaa ctacatctat cctgtcgttg gacccgatgg aagccccctg 600

ccaactgacg agtacaagcg accaattcac ccagtccttg gacctgatgg cagcccactg 660

ccgacagacg aatcaggcca tccactagga gaggacggac agccacttcc aacagatgct 720

tctggcgttc ctgtggataa ggacggtcag ccgctgccga cagacagcag tggacactac 780

gtcacagttc cacgtgaaga agctgtcacg aaagagctac caacggacga gagcggaaat 840

gtcatctacc cagtgacgaa acctgatggg tcaccgcttc caaccgatgc ttccgggaac 900

tttattactg aagaaggact gatcattggt cccgatggtg ttgctcttcc ctacccgcgt 960

aacaggacct gctccttaaa gcaactgaag atggatatcc ttttcgcggt aagcacgaca 1020

aaagtctcga aatccaccTt tgatagtatc ctgcgagcaa tatcaaagtt tgccgatgaa 1080

gtcgacttat ctcctgacgt tacccgcatt ggattagtat acggcagcaa ggacgtagtc 1140

gttccacttc cgcttggggg gtaccaagaa aaagatcata tgagggatga aattcgacgc 1200

atcgaatttt ctgatgatgg atcgcaagac tacatttctc tgtatggtcc cgccaagcaa 1260

caattcgtca tgtttcctcg agcggacagt gcgaagatcg ctatcttcct cattcaagat 1320

gaaataagtt actgcttatc cacgagaacg ttgagatgtg gttgcgctac tgctgtggat 1380

agcgattgtc gtcgaataaa caatgtccta gcggatgaca tcaaagtgtg caaggtccct 1440

gaaactgctg tagtccctac tccagttgtt catccacaag ggtcaagggc cgtctcggtc 1500

gttgtgcctc gattctttag tgctccgcca tttgacaccc acagtccgtc aaggctgaca 1560

ctgctggcag attttgctac ggagaaagaa cctctatgcg gggaacattc atttttatcc 1620

ccccagaaat ggggcaagaa tcactgtacg ttacgcattc ctctttcgat gccaggaata 1680

gatcacaaat ccgatgatca ctactactat gatgaccaga ccccattaga atccgaatat 1740

tcattggatt tgtttgggaa agcagaattg gtacgatttt tcgtacaggt caatgtggaa 1800

cgagaactgg accttgcccc cgaaacagta cgattctcgt cgcttcttcg atctaatgca 1860

gcttattaca agtctcctgg atctcgccca aacaactcca attcggcgac caaacgaagg 1920

aacagcccag ccgtcccctg atcggtgaac cccaggcttt taatgttgac aacgtttact 1980

ttctcgaact cctgctacat ttttcaaaac acaaataaaa cttttcaaaa aaaaaaaaaa 2040

aaa 2043

<210> 34
<211> 647
<212> PRT
<213> Ancylostoma caninum

<400> 34

Ser Pro Leu Pro Thr Asp Ala Ser Gly Asn Tyr Val Thr Asp Glu Gly
1 5 10 15

Thr Val Ile Glu Lys Asp Asp Glu Gly Arg Pro Leu Gly Pro Asp Gly
20 25 30

Gln Val Leu Pro Thr Asp Glu Ser Gly Asn Tyr Ile Tyr Pro Val Val
35 40 45

Gly Pro Asp Gly Ser Pro Leu Pro Thr Asp Glu His Lys Arg Pro Ile
50 55 60

His Pro Val Leu Gly Pro Asp Gly Ser Pro Leu Pro Thr Asp Glu Ser
65 70 75 80

Gly His Pro Leu Gly Glu Asp Gly Gln Pro Leu Pro Thr Asp Ala Ser
85 90 95

Gly Val Pro Val Asp Lys Asp Gly Gln Pro Leu Pro Thr Asp Ser Ser
100 105 110

Gly His Tyr Val Thr Val Pro Arg Glu Glu Ala Val Thr Lys Glu Leu
115 120 125

Pro Thr Asp Glu Ser Gly Asn Val Ile Tyr Pro Val Thr Lys Pro Asp
130 135 140

Gly Ser Pro Leu Pro Thr Asp Ala Ser Gly Asn Tyr Val Thr Asp Glu
145 150 155 160

Gly Thr Val Ile Glu Lys Asp Asp Glu Gly Arg Pro Leu Gly Pro Asp
165 170 175

Gly Gln Val Leu Pro Thr Asp Glu Ser Gly Asn Tyr Ile Tyr Pro Val
180 185 190

Val Gly Pro Asp Gly Ser Pro Leu Pro Thr Asp Glu Tyr Lys Arg Pro
195 200 205

Ile His Pro Val Leu Gly Pro Asp Gly Ser Pro Leu Pro Thr Asp Glu
210 215 220

Ser Gly His Pro Leu Gly Glu Asp Gly Gln Pro Leu Pro Thr Asp Ala
225 230 235 240

Ser Gly Val Pro Val Asp Lys Asp Gly Gln Pro Leu Pro Thr Asp Ser
245 250 255

Ser Gly His Tyr Val Thr Val Pro Arg Glu Glu Ala Val Thr Lys Glu
260 265 270

Leu Pro Thr Asp Glu Ser Gly Asn Val Ile Tyr Pro Val Thr Lys Pro
275 280 285

Asp Gly Ser Pro Leu Pro Thr Asp Ala Ser Gly Asn Phe Ile Thr Glu
290 295 300

Glu Gly Leu Ile Ile Gly Pro Asp Gly Val Ala Leu Pro Tyr Pro Arg
305 310 315 320

Asn Arg Thr Cys Ser Leu Lys Gln Leu Lys Met Asp Ile Leu Phe Ala
325 330 335

Val Ser Thr Thr Lys Val Ser Lys Ser Thr Phe Asp Ser Ile Leu Arg
340 345 350

Ala Ile Ser Lys Phe Ala Asp Glu Val Asp Leu Ser Pro Asp Val Thr
355 360 365

Arg Ile Gly Leu Val Tyr Gly Ser Lys Asp Val Val Val Pro Leu Pro
370 375 380

Leu Gly Gly Tyr Gln Glu Lys Asp His Met Arg Asp Glu Ile Arg Arg
385 390 395 400

Ile Glu Phe Ser Asp Asp Gly Ser Gln Asp Tyr Ile Ser Leu Tyr Gly

405 410 415

Pro Ala Lys Gln Gln Phe Val Met Phe Pro Arg Ala Asp Ser Ala Lys
420 425 430

Ile Ala Ile Phe Leu Ile Gln Asp Glu Ile Ser Tyr Cys Leu Ser Thr
435 440 445

Arg Thr Leu Arg Cys Gly Cys Ala Thr Ala Val Asp Ser Asp Phe Cys
450 455 460

Arg Arg Ile Asn Asn Val Leu Ala Asp Asp Ile Lys Val Cys Lys Val
465 470 475 480

Pro Glu Thr Ala Val Val Pro Thr Pro Val Val His Pro Gln Gly Ser
485 490 495

Arg Ala Val Ser Val Val Val Pro Arg Phe Phe Ser Ala Pro Pro Phe
500 505 510

Asp Thr His Ser Pro Ser Arg Leu Thr Leu Leu Ala Asp Phe Ala Thr
515 520 525

Glu Lys Glu Pro Leu Cys Gly Glu His Ser Phe Leu Ser Pro Gln Lys
530 535 540

Trp Gly Lys Asn His Cys Thr Leu Arg Ile Pro Leu Ser Met Pro Gly
545 550 555 560

Ile Asp His Lys Ser Asp Asp His Tyr Tyr Tyr Asp Asp Gln Thr Pro
565 570 575

Leu Glu Ser Glu Tyr Ser Leu Asp Leu Phe Gly Lys Ala Glu Leu Val
580 585 590

Arg Phe Phe Val Gln Val Asn Val Glu Arg Glu Leu Asp Leu Ala Pro
595 600 605

Glu Thr Val Arg Phe Ser Ser Leu Leu Arg Ser Asn Ala Ala Tyr Tyr
610 615 620

Lys Ser Pro Gly Ser Arg Pro Asn Asn Ser Asn Ser Ala Thr Lys Arg
625 630 635 640

Arg Asn Ser Pro Ala Val Pro
645

<210> 35
<211> 1262
<212> DNA
<213> Ancylostoma caninum

<400> 35
ttttattacc caagtttgag agaggctcgt gaagttggta gaaggcttac aaggatgagg 60

ctcattttac cacttgtcgc cttgataggt attggtctct cagcacatta tgaaagggac 120

tgtccatgta cgcccgaaaa attgtggctc gacgtagtgg taggtatcga cacctctatt 180

ggtatgacag aggaaggagt gacacaggtc ctcgccgatt tgtctacggt attcggagac 240

acaaaaatcg ctcaagggga agggcaccat tcccgcattg gagtcgttac atatgggctg 300

aatgccgaaa ctaggtacaa cttgactgat ttcaaatcaa cagacgatat gctggaggcg 360

atctgggata ttaagtgcag cgacgacaag tactccaatc tctttgctgg actgacgagg 420

acacaagaaa ttatgaagaa tggccgccaa ggaagactga gagcaaatgt cagatcagcc 480

attattatct acgcgagcga tttcagggaa ggcgacgtga atgacgcagt tcagctggca 540

catcagatca agatcggagg aacggatatc atcgtagttg cttttgacca aaaaggaaaa 600

gtcaatgcgc ttgaggggct ccagaagatt gcttcgcctg gtcgcctctt caagagcact 660

acgaaaaacc tagtcggtct aatccaggat gctttgtgcc agacaaactg cttttgcaaa 720

aagctctgga cgcaatacgg ggacggatct gtgaaatatg gagaatgtct aaggatcggt 780

ggaatcgacg ccaactggtt agcagctaaa aaagcatgtc agagactcat ccctggaggt 840

catctcgcca ctgagctcga cagctacaag catgacttta ttgcacgaat gttcaaggat 900

gactatagac acgagcctcc atacatgtat cacatcggac tttccttcga caaacagaag 960

aatgattact tctgggagca acccaaagat aggatgcctc tgccgctgaa ggactcacct 1020

ttccgatatt ggagtcgcgg tttccctaac cctcgggaaa aggatacttg cgtacttgca 1080

gctcaaacaa ccatactttc gcccgagatt ggctggcaga acgagcattg caccaaagtt 1140

gcaaagagat acatctgtca agtggaatca tgtgatacag acaactactg tgccaatcta 1200

taaaagtacg acaataaact gctcacctaa caagaataaa atatgacatc aaaaaaaaaa 1260

aa 1262

<210> 36
<211> 382
<212> PRT
<213> Ancylostoma caninum

<400> 36

Met Arg Leu Ile Leu Pro Leu Val Ala Leu Ile Gly Ile Gly Leu Ser
1 5 10 15

Ala His Tyr Glu Arg Asp Cys Pro Cys Thr Pro Glu Lys Leu Trp Leu
20 25 30

Asp Val Val Val Gly Ile Asp Thr Ser Ile Gly Met Thr Glu Glu Gly
35 40 45

Val Thr Gln Val Leu Ala Asp Leu Ser Thr Val Phe Gly Asp Thr Lys
50 55 60

Ile Ala Gln Gly Glu Gly His His Ser Arg Ile Gly Val Val Thr Tyr
65 70 75 80

Gly Leu Asn Ala Glu Thr Arg Tyr Asn Leu Thr Asp Phe Lys Ser Thr
85 90 95

Asp Asp Met Leu Glu Ala Ile Trp Asp Ile Lys Cys Ser Asp Asp Lys
100 105 110

Tyr Ser Asn Leu Phe Ala Gly Leu Thr Arg Thr Gln Glu Ile Met Lys
115 120 125

Asn Gly Arg Gln Gly Arg Leu Arg Ala Asn Val Arg Ser Ala Ile Ile
130 135 140

Ile Tyr Ala Ser Asp Phe Arg Glu Gly Asp Val Asn Asp Ala Val Gln
145 150 155 160

Leu Ala His Gln Ile Lys Ile Gly Gly Thr Asp Ile Ile Val Val Ala
165 170 175

Phe Asp Gln Lys Gly Lys Val Asn Ala Leu Glu Gly Leu Gln Lys Ile
180 185 190

Ala Ser Pro Gly Arg Leu Phe Lys Ser Thr Thr Lys Asn Leu Val Gly
195 200 205

Leu Ile Gln Asp Ala Leu Cys Gln Thr Asn Cys Phe Cys Lys Lys Leu
210 215 220

Trp Thr Gln Tyr Gly Asp Gly Ser Val Lys Tyr Gly Glu Cys Leu Arg
225 230 235 240

Ile Gly Gly Ile Asp Ala Asn Trp Leu Ala Ala Lys Lys Ala Cys Gln
245 250 255

Arg Leu Ile Pro Gly Gly His Leu Ala Thr Glu Leu Asp Ser Tyr Lys
260 265 270

His Asp Phe Ile Ala Arg Met Phe Lys Asp Asp Tyr Arg His Glu Pro
275 280 285

Pro Tyr Met Tyr His Ile Gly Leu Ser Phe Asp Lys Gln Lys Asn Asp
290 295 300

Tyr Phe Trp Glu Gln Pro Lys Asp Arg Met Pro Leu Pro Leu Lys Asp
305 310 315 320

Ser Pro Phe Arg Tyr Trp Ser Arg Gly Phe Pro Asn Pro Arg Glu Lys
325 330 335

Asp Thr Cys Val Leu Ala Ala Gln Thr Thr Ile Leu Ser Pro Glu Ile
340 345 350

Gly Trp Gln Asn Glu His Cys Thr Lys Val Ala Lys Arg Tyr Ile Cys
355 360 365

Gln Val Glu Ser Cys Asp Thr Asp Asn Tyr Cys Ala Asn Leu
370 375 380

<210> 37
<211> 892
<212> DNA
<213> Ancylostoma caninum

<400> 37
ggtttaatta cccaagtttg agatgaagct actcgctctt tccgctctct tcgcgctggc 60

cttcgctgct cctcgagaca agcggctagc agtgagcact atcactgtca ccggaggact 120

aggtctgtcc acgggatgcg tcgtcactgg caacgttcta tatgcaaacg gtttccgagt 180

acgtgagatt acaccatcgg agcagcaaga gttggtcaaa taccaaaacg acgtagctga 240

gtacaagacg gctctgaaac aagcaatcaa ggagcgtgag gagaaaatcc gagcccgtct 300

cgccggtaag aaggtgaagg ccgtggagtc aaccaaccaa gaggacctac cgaaaccgcc 360

acagaagccg tcattctgca caccagaaga cactacccaa ttcttcttcg aaggatgcat 420

gatccagaac aacaagatct acgtcggaaa cactttcgct cgagacctga ctcagcctga 480

aatcagcgaa ttgaaagaat tcgagaagaa attcaaggtc taccaggact acgtacagaa 540

gcaggccgaa cagcaagtga acagcctctt cggcggctct gacttcttct cggcgttgtt 600

cagcggcggt gagacgagca agccatccac gaccaccgtg gcaccagaac ttccggaaga 660

cgctcccgag cagccgccca cgccgaactt ctgcaccaga ataatctaag cctctaaatt 720

gttcgtttcg ctattggatt ggttggtttg gtgaatagcg attccgcttc ccctctcgta 780

cttacggtgt cgactagcac attagtcatg cgttgcaata tttgaacatt gtattgaggt 840

atattgtaca tttatataat aaaattatta tcttaaaaaa aaaaaaaaaa aa 892

<210> 38
<211> 228
<212> PRT
<213> Ancylostoma caninum

<400> 38

Met Lys Leu Leu Ala Leu Ser Ala Leu Phe Ala Leu Ala Phe Ala Ala
1 5 10 15

Pro Arg Asp Lys Arg Leu Ala Val Ser Thr Ile Thr Val Thr Gly Gly
20 25 30

Leu Gly Leu Ser Thr Gly Cys Val Val Thr Gly Asn Val Leu Tyr Ala

35 40 45

Asn Gly Phe Arg Val Arg Glu Ile Thr Pro Ser Glu Gln Gln Glu Leu
50 55 60

Val Lys Tyr Gln Asn Asp Val Ala Glu Tyr Lys Thr Ala Leu Lys Gln
65 70 75 80

Ala Ile Lys Glu Arg Glu Glu Lys Ile Arg Ala Arg Leu Ala Gly Lys
85 90 95

Lys Val Lys Ala Val Glu Ser Thr Asn Gln Glu Asp Leu Pro Lys Pro
100 105 110

Pro Gln Lys Pro Ser Phe Cys Thr Pro Glu Asp Thr Thr Gln Phe Phe
115 120 125

Phe Glu Gly Cys Met Ile Gln Asn Asn Lys Ile Tyr Val Gly Asn Thr
130 135 140

Phe Ala Arg Asp Leu Thr Gln Pro Glu Ile Ser Glu Leu Lys Glu Phe
145 150 155 160

Glu Lys Lys Phe Lys Val Tyr Gln Asp Tyr Val Gln Lys Gln Ala Glu
165 170 175

Gln Gln Val Asn Ser Leu Phe Gly Gly Ser Asp Phe Phe Ser Ala Leu
180 185 190

Phe Ser Gly Gly Glu Thr Ser Lys Pro Ser Thr Thr Thr Val Ala Pro
195 200 205

Glu Leu Pro Glu Asp Ala Pro Glu Gln Pro Pro Thr Pro Asn Phe Cys
210 215 220

Thr Arg Ile Ile
225

<210> 39
<211> 1722
<212> DNA
<213> Ancylostoma caninum

<400> 39
gggtttaatt acccaagttt gaggatgagg gtactcctgt tactgctact tttatccatt 60

tgcgcgagcg ctggctttct agacactaaa ttcggccaga agataaagaa aactcttgac 120

aagattaaag ctgtgcttaa cggcactgca ctcatcgcga ttcgtgaaaa attcattcga 180

ctaagggaaa aaataaaagc aaagctgacg ctctctccag cacgaaaggc tatattggac 240

gaagttatga agcatatcaa aatgatcaaa aaggataaga ttcaagagaa gggcgactca 300

atcgatgaaa tcaatgaaaa gagtgcaatc ggacagttgc tgtaccaggg tgacatcgtt 360

ctgacagaaa agcaagccca gcaaattacc gaagacattg aaaatgacaa aggcgaccgc 420

gaaaaacgac aggcgttccg tgatcgcaat tatccgcgaa cattatggtc gaagggagtg 480

tactttcact ttcataggaa cgcaactcct gaagttagaa gcgtttttgt gaaaggcgca 540

aaactttgga tgaaggatac ttgcatcgac ttcttcgaaa gcaactcagc gcctgatagg 600

attcgtgtgt tcaaagagaa cggatgttgg tcgtacgttg gtaggctggg cggtgaacaa 660

gatctgtcac tgggagaagg ttgtcaatcg gttggcacag ctgcgcacga aattggccac 720

gctattggct tctaccacac tcacgcaaga catgatcgcg ataactttat tacattcaac 780

gcacaaaatg tcaagcccga ttggttggac caattcactc ttcagactcc ggcaacgaat 840

gagaactatg gaataactta cgactatgga agtatcatgc attatggtgc aaatagcgcc 900

tcgcagaacg gacgtcctac aatggttccg catgatccca aatacgtaga aactcttgga 960

tcacccataa tttccttcta tgagcttctc atgatcaaca aacactacga ctgcactaag 1020

aactgtgacc cggctacttc tgcgcagtgt aagatgggtg gcttcccaca tcctcgggat 1080

tgtacaagat gcatttgccc tagtggatat ggaggcaaac tgtgcgacca gaagccagcc 1140

ggatgcggat ctatatacca ggccaccaat cagtaccaga ccttgcacga cgaaattgga 1200

gacaagagag cgggacagag acctagagaa gacatggact tctgctatta ttggatcacg 1260

gccccaaaag gttcaaaaat cgaaatcaaa attgctggat tatcacaagg agccgctgtt 1320

gaaggatgcc agtactgggg agtagaaatc aagactcatg ccgatcaacg tcttaccggc 1380

tacaggttct gcgcaccaga agatgttgga gttagattag tgtcgaactt caacatcgta 1440

ccaataatca catacaacat attctacgcg acctatgtcg atattcagta ccgtatcgtt 1500

ggtgataatg ttggcggtcc tatgcctcag ccacaaccaa atagcaattg tgtcgacaat 1560

gaacagtgtg cgacactcgt gagaacaaag aacttctgtc agagcagatt tttcacagag 1620

tccgtcaaaa gaggtctatg tccaaagtcc agcggtttct gtcgctaact tttcagcaaa 1680

caatggaata aatgttgcac cataaaaaaa aaaaaaaaaa aa 1722

<210> 40
<211> 536
<212> PRT
<213> Ancylostoma caninum

<400> 40

Met Arg Val Leu Leu Leu Leu Leu Leu Leu Ser Ile Cys Ala Ser Ala
1 5 10 15

Gly Phe Leu Asp Thr Lys Phe Gly Gln Lys Ile Lys Lys Thr Leu Asp
20 25 30

Lys Ile Lys Ala Val Leu Asn Gly Thr Ala Leu Ile Ala Ile Arg Glu
35 40 45

Lys Phe Ile Arg Leu Arg Glu Lys Ile Lys Ala Lys Leu Thr Leu Ser
50 55 60

Pro Ala Arg Lys Ala Ile Leu Asp Glu Val Met Lys His Ile Lys Met
65 70 75 80

Ile Lys Lys Asp Lys Ile Gln Glu Lys Gly Asp Ser Ile Asp Glu Ile
85 90 95

Asn Glu Lys Ser Ala Ile Gly Gln Leu Leu Tyr Gln Gly Asp Ile Val
100 105 110

Leu Thr Glu Lys Gln Ala Gln Gln Ile Thr Glu Asp Ile Glu Asn Asp
115 120 125

Lys Gly Asp Arg Glu Lys Arg Gln Ala Phe Arg Asp Arg Asn Tyr Pro
130 135 140

Arg Thr Leu Trp Ser Lys Gly Val Tyr Phe His Phe His Arg Asn Ala
145 150 155 160

Thr Pro Glu Val Arg Ser Val Phe Val Lys Gly Ala Lys Leu Trp Met
165 170 175

Lys Asp Thr Cys Ile Asp Phe Phe Glu Ser Asn Ser Ala Pro Asp Arg
180 185 190

Ile Arg Val Phe Lys Glu Asn Gly Cys Trp Ser Tyr Val Gly Arg Leu
195 200 205

Gly Gly Glu Gln Asp Leu Ser Leu Gly Glu Gly Cys Gln Ser Val Gly
210 215 220

Thr Ala Ala His Glu Ile Gly His Ala Ile Gly Phe Tyr His Thr His

225 230 235 240

Ala Arg His Asp Arg Asp Asn Phe Ile Thr Phe Asn Ala Gln Asn Val
245 250 255

Lys Pro Asp Trp Leu Asp Gln Phe Thr Leu Gln Thr Pro Ala Thr Asn
260 265 270

Glu Asn Tyr Gly Ile Thr Tyr Asp Tyr Gly Ser Ile Met His Tyr Gly
275 280 285

Ala Asn Ser Ala Ser Gln Asn Gly Arg Pro Thr Met Val Pro His Asp
290 295 300

Pro Lys Tyr Val Glu Thr Leu Gly Ile Asn Lys His Tyr Asp Cys Thr
305 310 315 320

Lys Asn Cys Asp Pro Ala Thr Ser Ala Gln Cys Lys Met Gly Gly Phe
325 330 335

Pro His Pro Arg Asp Cys Thr Arg Cys Ile Cys Pro Ser Gly Tyr Gly
340 345 350

Gly Lys Leu Cys Asp Gln Lys Pro Ala Gly Cys Gly Ser Ile Tyr Gln
355 360 365

Ala Thr Asn Gln Tyr Gln Thr Leu His Asp Glu Ile Gly Asp Lys Arg
370 375 380

Ala Gly Gln Arg Pro Arg Glu Asp Met Asp Phe Cys Tyr Tyr Trp Ile
385 390 395 400

Thr Ala Pro Lys Gly Ser Lys Ile Glu Ile Lys Ile Ala Gly Leu Ser
405 410 415

Gln Gly Ala Ala Val Glu Gly Cys Gln Tyr Trp Gly Val Glu Ile Lys
420 425 430

Thr His Ala Asp Gln Arg Leu Thr Gly Tyr Arg Phe Cys Ala Pro Glu
435 440 445

Asp Val Gly Val Arg Leu Val Ser Asn Phe Asn Ile Val Pro Ile Ile
450 455 460

Thr Tyr Asn Ile Phe Tyr Ala Thr Tyr Val Asp Ile Gln Tyr Arg Ile
465 470 475 480

Val Gly Asp Asn Val Gly Gly Pro Met Pro Gln Pro Gln Pro Asn Ser
485 490 495

Asn Cys Val Asp Asn Glu Gln Cys Ala Thr Leu Val Arg Thr Lys Asn
500 505 510

Phe Cys Gln Ser Arg Phe Phe Thr Ser Ser Val Lys Arg Gly Leu Cys
515 520 525

Pro Lys Ser Ser Gly Phe Cys Arg
530 535

<210> 41
<211> 850
<212> DNA
<213> Ancylostoma caninum

<400> 41
tttaattacc caagtttgag caatgaaata ctttgttctc tgcttctgcg ccttcttcgt 60

ggtcaatgct gatgaggaag acgatctacc ccgcaatcct ttgtgggacg cttacaagga 120

tgacaatggc aaatatgtga ttccgtacgt cattaacgga agttatggag aggagaaaaa 180

agttttattt gaaatgatgg acgaaatcga taagaatacc tgcgtccgct tcatacccag 240

atcgacagag caggattata tcgaaatcgt aaacagacta ggagaaggaa ccggcgctgt 300

tgtaggtaaa cctggaggga aaagcatcgt gttgttggaa tcgagcaaaa ttctaaatga 360

tccaactcct gcgcctgtaa tgcagacttt gatgaaaatc attggcttac cacctgaaca 420

cattcgacca gagaggaaag atcatatcaa gatacactgg gagaacatcg agaaaggtta 480

cgaagctttc ttcgccctct cctctgttaa gcccgatccg tacggaatac catatgatta 540

ctactccatc atgcactaca agaaggacgc ctttgccaag ccgggcacga tcacaatgga 600

aactttggat aagcgctacc aggatatcat tgggaatcaa gagaagccgt cgaagttgga 660

ttacaagaag atctgcacca agtataaatg cgatatctgc atgggtgaga agatgaagta 720

ttaaagaaag gaatgacgtt aacataagga atggttgccg atttcaacaa aacgaacgtc 780

taatacatct ggtgttgttc ctcatgttag aaatccaata aagcatttca ccgaaaaaaa 840

aaaaaaaaaa 850

<210> 42
<211> 233
<212> PRT
<213> Ancylostoma caninum

<400> 42

Met Lys Tyr Phe Val Leu Cys Phe Cys Ala Phe Phe Val Val Asn Ala
1 5 10 15

Asp Glu Glu Asp Asp Leu Pro Arg Asn Pro Leu Trp Asp Ala Tyr Lys
20 25 30

Asp Asp Asn Gly Lys Tyr Val Ile Pro Tyr Val Ile Asn Gly Ser Tyr
35 40 45

Gly Glu Glu Lys Lys Val Leu Phe Glu Met Met Asp Glu Ile Asp Lys
50 55 60

Asn Thr Cys Val Arg Phe Ile Pro Arg Ser Thr Glu Gln Asp Tyr Ile
65 70 75 80

Glu Ile Val Asn Arg Leu Gly Glu Gly Thr Gly Ala Val Val Gly Lys
85 90 95

Pro Gly Gly Lys Ser Ile Val Leu Leu Glu Ser Ser Lys Ile Leu Asn
100 105 110

Asp Pro Thr Pro Ala Pro Val Met Gln Thr Leu Met Lys Ile Ile Gly
115 120 125

Leu Pro Pro Glu His Ile Arg Pro Glu Arg Lys Asp His Ile Lys Ile
130 135 140

His Trp Glu Asn Ile Glu Lys Gly Tyr Glu Ala Phe Phe Ala Leu Ser
145 150 155 160

Ser Val Lys Pro Asp Pro Tyr Gly Ile Pro Tyr Asp Tyr Tyr Ser Ile
165 170 175

Met His Tyr Lys Lys Asp Ala Phe Ala Lys Pro Gly Thr Ile Thr Met
180 185 190

Glu Thr Leu Asp Lys Arg Tyr Gln Asp Ile Ile Gly Asn Gln Glu Lys
195 200 205

Pro Ser Lys Leu Asp Tyr Lys Lys Ile Cys Thr Lys Tyr Lys Cys Asp
210 215 220

Ile Cys Met Gly Glu Lys Met Lys Tyr

225 230

<210> 43
<211> 1168
<212> DNA
<213> Ancylostoma caninum

<400> 43
ttaattaccc aagtttgaga atggcaacta tgctcgcggt atgtcgtttg gtcgtcttcc 60

tcaccgccgt tcacacggtg tcagcaaggg gaagacccat caacattttc gagcaaaagg 120

aaggaggaga catcacacag ctgagagaaa aagggagcgc aatgttcaac gcccttcaca 180

gaacgtcgag tctgaagtgg aacaagaggg attcagacgg gaattttgtc ataccgtaca 240

taattacagg acgctatgac cgaacggagc ggggaatatc aaggaagcaa tgaggcgcat 300

cgaggcaaat acgtgtattc gtttcaagca aagagactat gagagagact atatcgagat 360

ccagaacaaa gctggacatg gatgttacac caatgtcggt cgtgtcggtg gcagaagtat 420

actgatgctc gagtccagct tcgaggaaac atgcatggag acagaaatcg tgctgcacga 480

gttgatgcac gttgtcggtc tgtggcacga acacatgcgc cacgatcgtg acaaatacat 540

caaagtgcac tacgagaaca tcgaaaggag ttactggaac caattcgaga aagtctcacc 600

gatggaagct accacgtata acgtaccgta tgactacaaa tccgtcatgc actacgagaa 660

gtcggcattc gccagacctg gacgaatcag catggaaacg cttgatccca aatatcagaa 720

cgtcatcgga caccagaagg acgcctctcc cagtgactac cgtaagatct gcgagatata 780

ccagtgtaag aagtgcatga acggcaagat cgagatcgga ggcgactcgg actccaaccc 840

gaaaccgcca accgaggccc cagtcaccat cagaccggcg ccagaaatca acggagaatg 900

ccgcgatatg atcccgtctt tctgccgagc gttggcccgc tcgcacatga tcgactgcag 960

cttcttccat aaacaacaat gctgtgcaac ctgcgccgag ttagggcaca gggatcagga 1020

ccagggagga tggttagaac aaacaggatg gccattcgac gggctcttcc gaatattcgg 1080

acaaggaggg tggcctttca ccttcttcaa tcgctggtaa ctaatacagg tcaaataaat 1140

atttgcaaaa taaaaaaaaa aaaaaaaa 1168

<210> 44
<211> 366
<212> PRT
<213> Ancylostoma caninum

<400> 44

Met Ala Thr Met Leu Ala Val Cys Arg Leu Val Val Phe Leu Thr Ala
1 5 10 15

Val His Thr Val Ser Ala Arg Gly Arg Pro Ile Asn Ile Phe Glu Gln
20 25 30

Lys Glu Gly Gly Asp Ile Thr Gln Leu Arg Glu Lys Gly Ser Ala Met
35 40 45

Phe Asn Ala Leu His Arg Thr Ser Ser Leu Lys Trp Asn Lys Arg Asp
50 55 60

Ser Asp Gly Asn Phe Val Ile Pro Tyr Ile Ile Thr Gly Arg Tyr Asp
65 70 75 80

Arg Thr Glu Arg Gly Thr Ile Lys Glu Ala Asn Arg Arg Ile Glu Ala
85 90 95

Asn Thr Cys Ile Arg Phe Lys Gln Arg Asp Tyr Glu Arg Asp Tyr Ile
100 105 110

Glu Ile Gln Asn Lys Ala Gly His Gly Cys Tyr Thr Asn Val Gly Arg
115 120 125

Val Gly Gly Arg Ser Ile Leu Met Leu Glu Ser Ser Phe Glu Glu Thr

130 135 140

Cys Met Glu Thr Glu Ile Val Leu His Glu Leu Met His Val Val Gly
145 150 155 160

Leu Trp His Glu His Met Arg His Asp Arg Asp Lys Tyr Ile Lys Val
165 170 175

His Tyr Glu Asn Ile Glu Arg Ser Tyr Trp Asn Gln Phe Glu Lys Val
180 185 190

Ser Pro Met Glu Ala Thr Thr Tyr Asn Val Pro Tyr Asp Tyr Lys Ser
195 200 205

Val Met His Tyr Glu Lys Ser Ala Phe Ala Arg Pro Gly Arg Ile Ser
210 215 220

Met Glu Thr Leu Asp Pro Lys Tyr Gln Asn Val Ile Gly His Gln Lys
225 230 235 240

Asp Ala Ser Pro Ser Asp Tyr Arg Lys Ile Cys Glu Ile Tyr Gln Cys
245 250 255

Lys Lys Cys Met Asn Gly Lys Ile Glu Ile Gly Gly Asp Ser Asp Ser
260 265 270

Asn Pro Lys Pro Pro Thr Glu Ala Pro Val Thr Ile Arg Pro Ala Pro
275 280 285

Glu Ile Asn Gly Glu Cys Arg Asp Met Ile Pro Ser Phe Cys Arg Ala
290 295 300

Leu Ala Arg Ser His Met Ile Asp Cys Ser Phe Phe His Lys Gln Gln
305 310 315 320

Cys Cys Ala Thr Cys Ala Glu Leu Gly His Arg Asp Gln Asp Gln Gly
325 330 335

Gly Trp Leu Glu Gln Thr Gly Trp Pro Phe Asp Gly Leu Phe Arg Ile
340 345 350

Phe Gly Gln Gly Gly Trp Pro Phe Thr Phe Phe Asn Arg Trp
355 360 365

<210> 45
<211> 621
<212> DNA
<213> Ancylostoma caninum

<400> 45
caagtttgag catgcttcga ctagctctct tcgcggtcct cttcgcttgc gcattttcag 60

cacccaacgt tgaagtgaac aaattcgagg atattcctga gcagtacaga gaactgatcc 120

ccaaggaggt agccgaccac atcaaggcta tcactgagga ggagaagacc atcttgaagg 180

aggtgctgaa ggactacgcc aaatacaagg acgagaatga gtatttggca gcgctgaagg 240

aaaagtcacc cagcctgcac gagaaggcaa agaagttcca cgacttcatt aaggctaagg 300

tcgacgcact tggggatgaa gcaaaggcgt tcgtgaagaa agtgattgct gctgctcgca 360

aactgcacgc agagctcctt gccgggaaca aaccttctct tgaggaactg aagaacactg 420

tcaagaaata cgtggccgaa ttcgacgcgc tgaccgcagc cgcaaaagaa gatctcaaga 480

agcacttccc catcctcact tccattttca ccaacgagaa ggcaaaggcg ttgatggaca 540

agcacttgcc gaactaggtg aagcagcagt tgtttttagt cgaataaatg tttcaacttt 600

ttaaaaaaaa aaaaaaaaaa a 621

<210> 46
<211> 181

<212> PRT
<213> Ancylostoma caninum

<400> 46

Met Leu Arg Leu Ala Leu Phe Ala Val Leu Phe Ala Cys Ala Phe Ser
1 5 10 15

Ala Pro Asn Val Glu Val Asn Lys Phe Glu Asp Ile Pro Glu Gln Tyr
20 25 30

Arg Glu Leu Ile Pro Lys Glu Val Ala Asp His Ile Lys Ala Ile Thr
35 40 45

Glu Glu Glu Lys Thr Ile Leu Lys Glu Val Leu Lys Asp Tyr Ala Lys
50 55 60

Tyr Lys Asp Glu Asn Glu Tyr Leu Ala Ala Leu Lys Glu Lys Ser Pro
65 70 75 80

Ser Leu His Glu Lys Ala Lys Lys Phe His Asp Phe Ile Lys Ala Lys
85 90 95

Val Asp Ala Leu Gly Asp Glu Ala Lys Ala Phe Val Lys Lys Val Ile
100 105 110

Ala Ala Ala Arg Lys Leu His Ala Glu Leu Leu Ala Gly Asn Lys Pro
115 120 125

Ser Leu Glu Glu Leu Lys Asn Thr Val Lys Lys Tyr Val Ala Glu Phe
130 135 140

Asp Ala Leu Thr Ala Ala Ala Lys Glu Asp Leu Lys Lys His Phe Pro
145 150 155 160

Ile Leu Thr Ser Ile Phe Thr Asn Glu Lys Ala Lys Ala Leu Met Asp
165 170 175

Lys His Leu Pro Asn
180

<210> 47
<211> 2384
<212> DNA
<213> Ancylostoma caninum

<400> 47
ggcacttcga catgaaggtc cttgccttag tgttactttg ggctgcaaca gccactgctc 60

tgctagacat atgtaaggag gaaatcaaga ctggaaattg taggggggcc ttccgcaagt 120

ttggctacga tcgatgcacg aataaatgta ttccgtacac gtatggaggc tgtggagggt 180

cgagcaacat gttcgacact ttggaagaat gccaagaaaa atgtggcaag cccgaggacc 240

gctgctcaaa accactggaa agaggaatat gtctggcatc aatgaaaaga tatggctacg 300

atacaagcag taagaagtgt aaggccttca tctatggcgg atgtggcggt aacgagaaca 360

atttcgagac aatggctgag tgccgagaaa cttgcaagga cacctcttct gaagaagaat 420

cagtacctga tgcatgccta ttgccatcag aagtggggcc atgtaaagga aaagaacgtc 480

gcttctactt tgatcaaaaa cgtggcaact gcaagtcgtt cttcttcggc ggttgtggtg 540

gaaatggaaa taatttcatg accaaagcca aatgcatgga aacctgctcg aaacacatca 600

aacctgaaac agagcaagac gtctgctcac agccaattaa agctggacct tgcatggcaa 660

tgttgaaaag atatgcgtac gacaacaaga aaaagaggtg cgtgcagttt atctatggag 720

gatgtaaggg aaacaagaac aacttcgaga gcatggaaga gtgcacccgg acatgtaaga 780

aagcagtacc agagcctgag caggacacct gctcacagcc cattgaagtt ggaccttgca 840

aggcaatgtt gaaaagatat gcgtacgaca acaagaaaaa taagtgcgta cggtttatct 900

atggaggatg taagggaaac aagaacaact tcgaaagcat ggaagagtgc acccggacat 960

gtaagaaagc agtaccagag cctgagcaag acacctgctc acagcccatt gaagttggac 1020

cttgcaaggc aatgttgaaa agatatgcgt acgacaacaa gaaaaataag tgcgtgcggt 1080

ttatctatgg aggatgtaag ggaaataaga acaacttcga aagcatggaa gagtgcaccc 1140

ggacatgcaa gaaagcagta ccagagcctg aacctgagaa agagacctgc tcacagccca 1200

ttgaagttgg accttgcaag gcaatgttga aaagatatgc gtacgacaac aagaaaaata 1260

agtgcgtacg gtttatctat ggaggatgta agggaaacaa gaacaacttc gaaagcatgg 1320

aagagtgcac ccggacatgt aagaaagcag taccagagcc tgagcaagac acctgctcac 1380

agcccattga agttggacct tgcaaggcaa tgttgaaaag atatgcgtac gacaacaaga 1440

aaaataagtg cgtgcggttt atctatggag gatgtaaggg aaataagaac aacttcgaaa 1500

gcatggaaga gtgcacccgg acatgcaaga aagcagtacc agagcctgaa cctgagaaag 1560

agacctgctc tcagcccatt gaagctggtc cttgcaaggc aatggtgaga cgatttgctt 1620

acgacaacgc aaaggaaaag tgcgtagagt tcttttacgg cggatgcaaa ggaaacaaga 1680

acaacttcga aaccatggaa gattgtactt ttacgtgtga gcaacggctg gcaaagcccg 1740

agcttgagaa ggatgtgtgt tcacaaccta tcacggctgg tccttgcaga gcatcaatac 1800

cgcgatacgg ctatgattct aaaaaacgaa agtgtgtgaa gttcacctac ggaggatgca 1860

aaggaaatgg taataggttc ccgacgaaga atgaatgtga gaagacatgc aagagaggag 1920

caactggaac tacgaatcca ggaggtgaaa atgataaatg cttgctgcca attgttaccg 1980

gcccatgcaa aggaaaaaat cgtcgctatg cttacaacaa caagacagga aaatgcgtga 2040

gattcaccta tggtggttgc gggggaaacg agaacaactt caagactaag aaagactgcc 2100

aggatgcgtg cgaaaacata aatgcagcta gtccatgcac ccttcctatc gacaaaggag 2160

aaggcgactt gaatctgacc agatatggct tcaaaaatgg caagtgtgtc gcgttcaaat 2220

acggcggacg acggggaaat ctcaacaatt ttggaagcaa agccgattgc aaagaagcct 2280

gcctcaagta actacgaagc tccgctgcaa atcccagaag atcattcggt tgtctctgcc 2340

gtctatgaaa caataaagta ttaattttgt taaaaaaaaa aaaa 2384

<210> 48
<211> 759
<212> PRT
<213> Ancylostoma caninum

<400> 48

Met Lys Val Leu Ala Leu Val Leu Leu Trp Ala Ala Thr Ala Thr Ala
1 5 10 15

Leu Leu Asp Ile Cys Lys Glu Glu Ile Lys Thr Gly Asn Cys Arg Gly
20 25 30

Ala Phe Arg Lys Phe Gly Tyr Asp Arg Cys Thr Asn Lys Cys Ile Pro
35 40 45

Tyr Thr Tyr Gly Gly Cys Gly Gly Ser Ser Asn Met Phe Asp Thr Leu
50 55 60

Glu Glu Cys Gln Glu Lys Cys Gly Lys Pro Glu Asp Arg Cys Ser Lys
65 70 75 80

Pro Leu Glu Arg Gly Ile Cys Leu Ala Ser Met Lys Arg Tyr Gly Tyr
85 90 95

Asp Thr Ser Ser Lys Lys Cys Lys Ala Phe Ile Tyr Gly Gly Cys Gly
100 105 110

Gly Asn Glu Asn Asn Phe Glu Thr Met Ala Glu Cys Arg Glu Thr Cys
115 120 125

Lys Asp Thr Ser Ser Glu Glu Glu Ser Val Pro Asp Ala Cys Leu Leu

130 135 140

Pro Ser Glu Val Gly Pro Cys Lys Gly Lys Glu Arg Arg Phe Tyr Phe
145 150 155 160

Asp Gln Lys Arg Gly Asn Cys Lys Ser Phe Phe Phe Gly Gly Cys Gly
165 170 175

Gly Asn Gly Asn Asn Phe Met Thr Lys Ala Lys Cys Met Glu Thr Cys
180 185 190

Ser Lys His Ile Lys Pro Glu Thr Glu Gln Asp Val Cys Ser Gln Pro
195 200 205

Ile Lys Ala Gly Pro Cys Met Ala Met Leu Lys Arg Tyr Ala Tyr Asp
210 215 220

Asn Lys Lys Lys Arg Cys Val Gln Phe Ile Tyr Gly Gly Cys Lys Gly
225 230 235 240

Asn Lys Asn Asn Phe Glu Ser Met Glu Glu Cys Thr Arg Thr Cys Lys
245 250 255

Lys Ala Val Pro Glu Pro Glu Gln Asp Thr Cys Ser Gln Pro Ile Glu
260 265 270

Val Gly Pro Cys Lys Ala Met Leu Lys Arg Tyr Ala Tyr Asp Asn Lys
275 280 285

Lys Asn Lys Cys Val Arg Phe Ile Tyr Gly Gly Cys Lys Gly Asn Lys
290 295 300

Asn Asn Phe Glu Ser Met Glu Glu Cys Thr Arg Thr Cys Lys Lys Ala
305 310 315 320

Val Pro Glu Pro Glu Gln Asp Thr Cys Ser Gln Pro Ile Glu Val Gly
325 330 335

Pro Cys Lys Ala Met Leu Lys Arg Tyr Ala Tyr Asp Asn Lys Lys Asn
340 345 350

Lys Cys Val Arg Phe Ile Tyr Gly Gly Cys Lys Gly Asn Lys Asn Asn
355 360 365

Phe Glu Ser Met Glu Glu Cys Thr Arg Thr Cys Lys Lys Ala Val Pro
370 375 380

Glu Pro Glu Pro Glu Lys Glu Thr Cys Ser Gln Pro Ile Glu Val Gly
385 390 395 400

Pro Cys Lys Ala Met Leu Lys Arg Tyr Ala Tyr Asp Asn Lys Lys Asn
405 410 415

Lys Cys Val Arg Phe Ile Tyr Gly Gly Cys Lys Gly Asn Lys Asn Asn
420 425 430

Phe Glu Ser Met Glu Glu Cys Thr Arg Thr Cys Lys Lys Ala Val Pro
435 440 445

Glu Pro Glu Gln Asp Thr Cys Ser Gln Pro Ile Glu Val Gly Pro Cys
450 455 460

Lys Ala Met Leu Lys Arg Tyr Ala Tyr Asp Asn Lys Lys Asn Lys Cys
465 470 475 480

Val Arg Phe Ile Tyr Gly Gly Cys Lys Gly Asn Lys Asn Asn Phe Glu
485 490 495

Ser Met Glu Glu Cys Thr Arg Thr Cys Lys Lys Ala Val Pro Glu Pro
500 505 510

Glu Pro Glu Lys Glu Thr Cys Ser Gln Pro Ile Glu Ala Gly Pro Cys
515 520 525

Lys Ala Met Val Arg Arg Phe Ala Tyr Asp Asn Ala Lys Glu Lys Cys
530 535 540

Val Glu Phe Phe Tyr Gly Gly Cys Lys Gly Asn Lys Asn Asn Phe Glu
545 550 555 560

Thr Met Glu Asp Cys Thr Phe Thr Cys Glu Gln Arg Leu Ala Lys Pro
565 570 575

Glu Leu Glu Lys Asp Val Cys Ser Gln Pro Ile Thr Ala Gly Pro Cys
580 585 590

Arg Ala Ser Ile Pro Arg Tyr Gly Tyr Asp Ser Lys Lys Arg Lys Cys
595 600 605

Val Lys Phe Thr Tyr Gly Gly Cys Lys Gly Asn Gly Asn Arg Phe Pro
610 615 620

Thr Lys Asn Glu Cys Glu Lys Thr Cys Lys Arg Gly Ala Thr Gly Thr
625 630 635 640

Thr Asn Pro Gly Gly Glu Asn Asp Lys Cys Leu Leu Pro Ile Val Thr
645 650 655

Gly Pro Cys Lys Gly Lys Asn Arg Arg Tyr Ala Tyr Asn Asn Lys Thr
660 665 670

Gly Lys Cys Val Arg Phe Thr Tyr Gly Gly Cys Gly Gly Asn Glu Asn
675 680 685

Asn Phe Lys Thr Lys Lys Asp Cys Gln Asp Ala Cys Glu Asn Ile Asn
690 695 700

Ala Ala Ser Pro Cys Thr Leu Pro Ile Asp Lys Gly Glu Gly Asp Leu
705 710 715 720

Asn Leu Thr Arg Tyr Gly Phe Lys Asn Gly Lys Cys Val Ala Phe Lys
725 730 735

Tyr Gly Gly Arg Arg Gly Asn Leu Asn Asn Phe Gly Ser Lys Ala Asp
740 745 750

Cys Lys Glu Ala Cys Leu Lys
755

<210> 49
<211> 1413
<212> DNA
<213> Ancylostoma caninum

<400> 49
ctcgcactat ttaccctagc tgtagctagc gtacacagaa ggacattcca ccacccgcgc 60

cgctatgtga agtcggtgtc gctttcgcgt caaccaacac ttcgtgaacg attgctcgga 120

actggcagtt gggaagacta tcagaaacag cgttaccact accagaagaa acttctggca 180

aagtatgcgg cgatcaaagc gacaaaactg cagtctacca atgaaattga cgagcttctt 240

cgcaactaca tggatgcgca atacttcggc accatccaaa tcggaactcc agcgcagaat 300

ttcacagtga ttttcgacac cggttcttcc aatctgtggg tgccgtccga gaaaatgcca 360

ttccacgaca tcgcgtgcat gcttcgtcac cgttatgact ccggagcatc gtcgacgtac 420

aaggaggatg gacgaaagat ggccatccag tatggcactg gctcaatgaa gggcttcatt 480

tcaaaggata atgtctgcat cgctggaatt tgcgctgaag agcaaccgtt tgctgaggca 540

acgagcgagc caggcctcac cttcatcgca gcgaagtttg atggaatcct tggcataacc 600

ttccctgaaa tctctgtgct cggagtaccg ccagtattcc acacgttcat tgaacagaag 660

aaagtgccga gcccggtgtt cgctctctgg ctcaacagaa atcctgactc ggaactcgga 720

ggtgagatca ccctcggtgg aatggacacc cgacgatacg ttgagccgat cacatggact 780

ccagtgacaa ggcgagggta ctggcagttc aagatggaca aggttcaagg aggatcaaca 840

tccattgctt gccccaatga attttctgga tgccaggcta ttgctgacac tggcacttcc 900

ctcattgctg gacctaaagc acagtcgagg gcatccagaa attcattggt gcttgagcca 960

acttatgaag gagagtacat gattccttgc gacaaggtgc ctttccctcc ccgattatcc 1020

ttcgttatcg aagcccgcac tttcaccctc aagggtgagg attacgtctt gaccgtgaaa 1080

gctggtggta aatcgatttg cctgtccggt ttcatgggaa tggacttccc agagaggatc 1140

ggagagttgt ggattcttgg ggacgttttt attggaaagt actacaccgt cttcgatgtt 1200

ggccaggccc gtcttggatt cgctcaagct aagtcagaag atggctatcc ggttggccct 1260

gctgttcgaa ggtacaacaa gttctcggag gacagcggca gtgatgagga tgatgtattc 1320

actctataag taacatgtat ccacaacttg ctctaatcct gatacgtgta ccgtgtctaa 1380

cgtgcttcca cctttgataa actgattaat ctc 1413

<210> 50
<211> 442
<212> PRT
<213> Ancylostoma caninum

<400> 50

Leu Ala Leu Phe Thr Leu Ala Val Ala Ser Val His Arg Arg Thr Phe
1 5 10 15

His His Pro Arg Arg Tyr Val Lys Ser Val Ser Leu Ser Arg Gln Pro
20 25 30

Thr Leu Arg Glu Arg Leu Leu Gly Thr Gly Ser Trp Glu Asp Tyr Gln
35 40 45

Lys Gln Arg Tyr His Tyr Gln Lys Lys Leu Leu Ala Lys Tyr Ala Ala
50 55 60

Ile Lys Ala Thr Lys Leu Gln Ser Thr Asn Glu Ile Asp Glu Leu Leu
65 70 75 80

Arg Asn Tyr Met Asp Ala Gln Tyr Phe Gly Thr Ile Gln Ile Gly Thr
85 90 95

Pro Ala Gln Asn Phe Thr Val Ile Phe Asp Thr Gly Ser Ser Asn Leu
100 105 110

Trp Val Pro Ser Glu Lys Met Pro Phe His Asp Ile Ala Cys Met Leu
115 120 125

Arg His Arg Tyr Asp Ser Gly Ala Ser Ser Thr Tyr Lys Glu Asp Gly
130 135 140

Arg Lys Met Ala Ile Gln Tyr Gly Thr Gly Ser Met Lys Gly Phe Ile
145 150 155 160

Ser Lys Asp Asn Val Cys Ile Ala Gly Ile Cys Ala Glu Glu Gln Pro
165 170 175

Phe Ala Glu Ala Thr Ser Glu Pro Gly Leu Thr Phe Ile Ala Ala Lys
180 185 190

Phe Asp Gly Ile Leu Gly Ile Thr Phe Pro Glu Ile Ser Val Leu Gly

195 200 205

Val Pro Pro Val Phe His Thr Phe Ile Glu Gln Lys Lys Val Pro Ser
210 215 220

Pro Val Phe Ala Leu Trp Leu Asn Arg Asn Pro Asp Ser Glu Leu Gly
225 230 235 240

Gly Glu Ile Thr Leu Gly Gly Asn Asp Thr Arg Arg Tyr Val Glu Pro
245 250 255

Ile Thr Trp Thr Pro Val Thr Arg Arg Gly Tyr Trp Gln Phe Lys Met
260 265 270

Asp Lys Val Gln Gly Gly Ser Thr Ser Ile Ala Cys Pro Asn Glu Phe
275 280 285

Ser Gly Cys Gln Ala Ile Ala Asp Thr Gly Thr Ser Leu Ile Ala Gly
290 295 300

Pro Lys Ala Gln Ser Arg Ala Ser Arg Asn Ser Leu Val Leu Glu Pro
305 310 315 320

Thr Tyr Glu Gly Glu Tyr Met Ile Pro Cys Asp Lys Val Pro Phe Pro
325 330 335

Pro Arg Leu Ser Phe Val Ile Glu Ala Arg Thr Phe Thr Leu Lys Gly
340 345 350

Glu Asp Tyr Val Leu Thr Val Lys Ala Gly Gly Lys Ser Ile Cys Leu
355 360 365

Ser Gly Phe Met Gly Met Asp Phe Pro Glu Arg Ile Gly Glu Leu Trp
370 375 380

Ile Leu Gly Asp Val Phe Ile Gly Lys Tyr Tyr Thr Val Phe Asp Val
385 390 395 400

Gly Gln Ala Arg Leu Gly Phe Ala Gln Ala Lys Ser Glu Asp Gly Tyr
405 410 415

Pro Val Gly Pro Ala Val Arg Arg Tyr Asn Lys Phe Ser Glu Asp Ser
420 425 430

Gly Ser Asp Glu Asp Asp Val Phe Thr Leu
435 440

<210> 51
<211> 421
<212> DNA
<213> Ancylostoma caninum

<220>
<221> misc_feature
<222> (27)..(27)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (353)..(353)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (366)..(366)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (394)..(394)
<223> n is a, c, g, or t

<220>

<221> misc_feature
<222> (413)..(413)
<223> n is a, c, g, or t

<400> 51
ttgacacagg ttcatcaaat ctctggngct cctgcatatt atgtggagga aatcgcttcg 60

aacctgaccg caacgtacaa caaggaacat gacctctact acatcgactg cagagccaat 120

gcgtctatca cgctcacaat tggccagcgc cagtacaaaa ttgaatcaaa gaacctcatc 180

attcatgtcg aagcagatac atgcatcttg gcactacatg gataccactt tctcggagca 240

acatggatct ttggtgcacc gttcataagg cagttctgta atatttatga tatgggtaac 300

aaaaggatag gattcgctca ttcgctgcag aattagcctg catttactag ttnttattcg 360

acattnttaa acaactccct caataaagta ttgngtttca aaaaaaaaaa aanaaaaaaa 420

a 421

<210> 52
<211> 111
<212> PRT
<213> Ancylostoma caninum

<400> 52

Leu Thr Gln Val His Gln Ile Ser Gly Ala Pro Ala Tyr Tyr Val Glu
1 5 10 15

Glu Ile Ala Ser Asn Leu Thr Ala Thr Tyr Asn Lys Glu His Asp Leu
20 25 30

Tyr Tyr Ile Asp Cys Arg Ala Asn Ala Ser Ile Thr Leu Thr Ile Gly
35 40 45

Gln Arg Gln Tyr Lys Ile Glu Ser Lys Asn Leu Ile Ile His Val Glu
50 55 60

Ala Asp Thr Cys Ile Leu Ala Leu His Gly Tyr His Phe Leu Gly Ala
65 70 75 80

Thr Trp Ile Phe Gly Ala Pro Phe Ile Arg Gln Phe Cys Asn Ile Tyr
85 90 95

Asp Met Gly Asn Lys Arg Ile Gly Phe Ala His Ser Leu Gln Asn
100 105 110

<210> 53
<211> 371
<212> DNA
<213> Ancylostoma caninum

<400> 53
aaggcgtatc cggaatgcgg ggagaatgag tggctcgacg actgtggaac tcagaagcca 60

tgcgaggcca agtgcaatga ggaacccccc gaggaggaag atccgatatg ccgctcacgt 120

ggttgtttat tacctcctgc ttgcgtatgc aaagacggat tctacagaga cacggtgatc 180

ggcgactgtg ttagggaaga agaatgcgac caacatgaga ttatacatgt ctgaacgaga 240

aagcaacaat aaccaaaggt tccaactctc gctctgcaaa atcgctagtt ggatgtctct 300

tttgcgtccg aatagtttta gttgatatta agtaagaact cctgctggaa agaataaagc 360

tttccaactc c 371

<210> 54
<211> 77
<212> PRT
<213> Ancylostoma caninum

<400> 54

Lys Ala Tyr Pro Glu Cys Gly Glu Asn Glu Trp Leu Asp Asp Cys Gly
1 5 10 15

Thr Gln Lys Pro Cys Glu Ala Lys Cys Asn Glu Glu Pro Pro Glu Glu

20 25 30

Glu Asp Pro Ile Cys Arg Ser Arg Gly Cys Leu Leu Pro Pro Ala Cys
35 40 45

Val Cys Lys Asp Gly Phe Tyr Arg Asp Thr Val Ile Gly Asp Cys Val
50 55 60

Arg Glu Glu Glu Cys Asp Gln His Glu Ile Ile His Val
65 70 75

<210> 55
<211> 1321
<212> DNA
<213> Ancylostoma ceylanicum

<400> 55
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agtgaaagcc agctttggct gctctaacag tgggataact gatagcgatc ggcaagcgtt 120

cctcgacttc cacaacaatg ctcggagacg agttgcgcaa ggagttgagg ataacaaatc 180

cggcaaactg aatccagcga agaacatgta taagctggac tgggactgtg agatggaaca 240

gaagctccag gatgctatcc aatcctgccc aggcggcttt gctggaattc aaggtgttgc 300

gcagaatata ataagctggt caggctccgg tggattcccg aatccatcag aaaagataaa 360

ctcaacactt gccagctggt ggggtggtgc aaaaaacaac ggcgtcgcct cagacaacaa 420

atacactggt ggaggtcttt acgccttttc caatatggtc ttctctgaga cgacaaaact 480

cggttgcgcc tacaaggttt gcggcactaa actgacgcta tcgtgcattt ataacggaat 540

tgggtatatg acaggcgcgc caatgtggga gacaggtcag gcttgcaagg ccggagcaga 600

ctgcaccaca ttcaagaact caggttgcga agacggcctc tgcacgaaag gagcagatgt 660

ccctgagacg aaccagcagt gtccgtcaaa caccggaatg actgattcag tcagagatac 720

tttcctttca ttgcacaacg aattcaggtc gagtgttgcc cgaggtttgg aacccgatgc 780

tcttggcgga aatgcaccaa aagcatccaa aatgctcaag atggtgtacg actgtgaagt 840

agaagcatca gccatcagac atgggaataa atgcgtctac caacattctc acggcgatga 900

aagacccggc ctaggagaaa acatttacaa aaccagcatt gtcaaatttg agaagaacaa 960

agcagccaag caggcttcac aactttggtg gaacgagttg aaagagttcg gtgtcggccc 1020

atccaacatg ctcactgatg ctctctggaa caggcccaac atgcagattg gtcattacac 1080

ccagatggcc tgggagagca cctacaaact tggatgcgct gttatattct gcaatgattt 1140

cacatttggt gtttgtcagt atggaccagg aggcaattac atgaatcacc tgatctacac 1200

tattggtcaa ccatgttccg agtgtgaagc taccgccact tgcagcgtga ccgaaggatt 1260

gtgcagtgct ccttaattag tctacaataa agatgctact ttccaaaaaa aaaaaaaaaa 1320

a 1321

<210> 56
<211> 422
<212> PRT
<213> Ancylostoma ceylanicum

<400> 56

Phe Ser Pro Val Val Val Ile Ser Val Val Leu Thr Val Ala Phe Cys
1 5 10 15

Asp Ala Ser Pro Val Lys Ala Ser Phe Gly Cys Ser Asn Ser Gly Ile
20 25 30

Thr Asp Ser Asp Arg Gln Ala Phe Leu Asp Phe His Asn Asn Ala Arg
35 40 45

Arg Arg Val Ala Gln Gly Val Glu Asp Asn Lys Ser Gly Lys Leu Asn
50 55 60

Pro Ala Lys Asn Met Tyr Lys Leu Asp Trp Asp Cys Glu Met Glu Gln
65 70 75 80

Lys Leu Gln Asp Ala Ile Gln Ser Cys Pro Gly Gly Phe Ala Gly Ile
85 90 95

Gln Gly Val Ala Gln Asn Ile Ile Ser Trp Ser Gly Ser Gly Gly Phe
100 105 110

Pro Asn Pro Ser Glu Lys Ile Asn Ser Thr Leu Ala Ser Trp Trp Gly
115 120 125

Gly Ala Lys Asn Asn Gly Val Ala Ser Asp Asn Lys Tyr Thr Gly Gly
130 135 140

Gly Leu Tyr Ala Phe Ser Asn Met Val Phe Ser Glu Thr Thr Lys Leu
145 150 155 160

Gly Cys Ala Tyr Lys Val Cys Gly Thr Lys Leu Thr Leu Ser Cys Tyr
165 170 175

Asn Gly Ile Gly Tyr Met Thr Gly Ala Pro Met Trp Glu Thr Gly Gln
180 185 190

Ala Cys Lys Ala Gly Ala Asp Cys Thr Thr Phe Lys Asn Ser Gly Cys
195 200 205

Glu Asp Gly Leu Cys Thr Lys Gly Ala Asp Val Pro Glu Thr Asn Gln
210 215 220

Gln Cys Pro Ser Asn Thr Gly Met Thr Asp Ser Val Arg Asp Thr Phe
225 230 235 240

Leu Ser Leu His Asn Glu Phe Arg Ser Ser Val Ala Arg Gly Leu Glu
245 250 255

Pro Asp Ala Leu Gly Gly Asn Ala Pro Lys Ala Ser Lys Met Leu Lys
260 265 270

Met Val Tyr Asp Cys Glu Val Glu Ala Ser Ala Ile Arg His Gly Asn
275 280 285

Lys Cys Val Tyr Gln His Ser His Gly Asp Glu Arg Pro Gly Leu Gly
290 295 300

Glu Asn Ile Tyr Lys Thr Ser Ile Val Lys Phe Glu Lys Asn Lys Ala
305 310 315 320

Ala Lys Gln Ala Ser Gln Leu Trp Trp Asn Glu Leu Lys Glu Phe Gly
325 330 335

Val Gly Pro Ser Asn Met Leu Thr Asp Ala Trp Asn Arg Pro Asn Met
340 345 350

Gln Ile Gly His Tyr Thr Gln Met Ala Trp Glu Ser Thr Tyr Lys Leu
355 360 365

Gly Cys Ala Val Ile Phe Cys Asn Asp Phe Thr Phe Gly Val Cys Gln
370 375 380

Tyr Gly Pro Gly Gly Asn Tyr Met Asn His Leu Ile Tyr Thr Ile Gly
385 390 395 400

Gln Pro Cys Ser Glu Cys Glu Ala Thr Ala Thr Cys Ser Val Thr Glu
405 410 415

Gly Leu Cys Ser Ala Pro

420

<210> 57
<211> 740
<212> DNA
<213> Ancylostoma ceylanicum

<400> 57
gttctcgtac cacttctggt tctactggct gtttctgttg atgcaaattc cgtgagatgc 60

ggaaataatg gaatgaccga cgaggcccga cagaaattcc tcgacatgca caacggttac 120

agatcgcagg ttgccaaagg acaggccaag gatgcactct caggaaatgc accaaaagct 180

gccaaaatga agaaaatggt atatgactgt ggtgtcgaat caactgcaat gcagaatgct 240

aaaaaatgtg tcttcactca ttcgcatatg aagggacttg gcgaaaacat atggatgacg 300

actgcacgcg agatggataa agtgaaatca gctgaacagg ctagtcaggg ttggttcagt 360

gaactcgcgg aatacggtgt agggcctgaa aataagctaa caatgcagct gtggaacagg 420

ccaaatactc agattggaca ttacacgcag atggtctggc aggacaccta caaactcgga 480

tgttatgtgg aatggtgctc atctatgacc tacggcgtgt gtcagtatag ccctcaaggt 540

aacatgatga actcaatcat ctacgaaaaa ggaaacccct gcactcagga ttcggactgt 600

ggctcaaatg ccagatgcac cgctgacaag gcgctttgca tcgtgcatgg atagctgggc 660

tatcccacgg tcaacagcgc ttctactaat tagctttgct tcctctataa ataaatgcat 720

tgaaacaaaa aaaaaaaaaa 740

<210> 58
<211> 217
<212> PRT
<213> Ancylostoma ceylanicum

<400> 58

Val Leu Val Pro Leu Leu Val Leu Leu Ala Val Ser Val Asp Ala Asn
1 5 10 15

Ser Val Arg Cys Gly Asn Asn Gly Met Thr Asp Glu Ala Arg Gln Lys
20 25 30

Phe Leu Asp Met His Asn Gly Tyr Arg Ser Gln Val Ala Lys Gly Gln
35 40 45

Ala Lys Asp Ala Leu Ser Gly Asn Ala Pro Lys Ala Ala Lys Met Lys
50 55 60

Lys Met Val Tyr Asp Cys Gly Val Glu Ser Thr Ala Met Gln Asn Ala
65 70 75 80

Lys Lys Cys Val Phe Thr His Ser His Met Lys Gly Leu Gly Glu Asn
85 90 95

Ile Trp Met Thr Thr Ala Arg Glu Met Asp Lys Val Lys Ser Ala Glu
100 105 110

Gln Ala Ser Gln Gly Trp Phe Ser Glu Leu Ala Glu Tyr Gly Val Gly
115 120 125

Pro Glu Asn Lys Leu Thr Met Gln Leu Trp Asn Arg Pro Asn Thr Gln
130 135 140

Ile Gly His Tyr Thr Gln Met Val Trp Gln Asp Thr Tyr Lys Leu Gly
145 150 155 160

Cys Tyr Val Glu Trp Cys Ser Ser Met Thr Tyr Gly Val Cys Gln Tyr
165 170 175

Ser Pro Gln Gly Asn Met Met Asn Ser Ile Ile Tyr Glu Lys Gly Asn
180 185 190

Pro Cys Thr Gln Asp Ser Asp Cys Gly Ser Asn Ala Arg Cys Thr Ala
195 200 205

Asp Lys Ala Leu Cys Ile Val His Gly
210 215

<210> 59
<211> 1705
<212> DNA
<213> Ancylostoma ceylanicum

<400> 59
gtttgaggat gagggtattc cttttagtcc tcttgttggc tatttgtgcg agcgctggtt 60

tctttgacac caagcttggt gagaaaataa agaaaacgct tggcaaaatc aaagctgcgc 120

tcaacggcac cttactcatg aaaattcgtg aaaaattcat tgcactgaga gaaaaaataa 180

aggctaagct gaagctctcc ccggcacgaa aagccctact aggcgaaatt atgaagcaca 240

ttattaaaat caaaaaggat aaaattcaag agaaaggtga ctcaatcgaa gaaatcaact 300

cgaaaagtgc tatcggagag ttgctgtacc aaggtgacat cgttctgaca aataagcaag 360

cccaggagat tgttgatgac attgagggtg atgaaaatga ccgcggaaaa cgacaggcgt 420

tccgtgatcg caactatcca cggacattat ggtcgaaggg agtgtattat tacttccatg 480

gaaacgcaac tcctgaggtg agaagcgttt tcacgaaagg cgcaagactt tggatgaaag 540

atacttgcat tgacttcttt gagagcaact cagcacccga taggattcga gttttcaaag 600

aacaaggatg ttggtcgtac gttggtagga tcgggggtca gcaagatctg tcgctgggaa 660

aaggctgtga atcggttgga acagctgcac acgaaatcgg tcatgctatt ggcttctacc 720

acactcactc aagacacgat cgcgataact tcatcacatt taacgcacaa aatgtcaagc 780

ctgattggtt ggaccaattc accaagcaga ccccggctac taatgagaac tacggaatta 840

catacgacta cggaagtatt atgcactatg gcgcaaatag cgcctctgcg aatggacagc 900

cttcaatggt tccgtttgac ccgaaatacg tagaaactct cggatcaccc ataatttcct 960

tttatgaact tctcatgatc aacaaaccct acgagtgcac caagaattgc gatccgaata 1020

cttctgcgca gtgtaagatg ggtggcttcc cacatcctcg ggattgtgga agatgcattt 1080

gtcccagtgg atatggaggc caactatgcg accagaagcc atccggatgc ggatcgatcc 1140

tccaagcgac cgctcagtac cagaacttgc acgacaaacg tggaaacgaa gcagcagggc 1200

agagacctag agaagacatg gacttctgct actactggat tacggctcca cagggttcaa 1260

gaatcgaaat caaaatcgct gatctatctc gaggagccgc tgttgatggg tgtcagtatt 1320

ggggagtaga aattaagact cacgctgacc agcgcctcac tggctacagg ttctgtgctc 1380

cagaagatgt cggacgtaca ttggtgtcga actctaacat cgtaccaata atcacataca 1440

atagatttta tgcaaccact gttgatatcc agtaccgaat cgttggtggt aatgttggcg 1500

gaccaaggcc tcagccacaa ccaaacagca attgcgtcga caatgaacag tgcgcgaccc 1560

tcatcagaac aaagaatttc tgtcagagca gatcgttcac agagtccgtc aaaagaggtc 1620

tatgtccaaa ggcatgcggt ttttgccgct aacttttcac gagacaatga aataaatatt 1680

cgcagcatca aaaaaaaaaa aaaaa 1705

<210> 60
<211> 545
<212> PRT
<213> Ancylostoma ceylanicum

<400> 60

Met Arg Val Phe Leu Leu Val Leu Leu Leu Ala Ile Cys Ala Ser Ala
1 5 10 15

Gly Phe Phe Asp Thr Lys Leu Gly Glu Lys Ile Lys Lys Thr Leu Gly
20 25 30

Lys Ile Lys Ala Ala Leu Asn Gly Thr Leu Leu Met Lys Ile Arg Glu

35 40 45

Lys Phe Ile Ala Leu Arg Glu Lys Ile Lys Ala Lys Leu Lys Leu Ser
50 55 60

Pro Ala Arg Lys Ala Leu Leu Gly Glu Ile Met Lys His Ile Ile Lys
65 70 75 80

Ile Lys Lys Asp Lys Ile Gln Glu Lys Gly Asp Ser Ile Glu Glu Ile
85 90 95

Asn Ser Lys Ser Ala Ile Gly Glu Leu Leu Tyr Gln Gly Asp Ile Val
100 105 110

Leu Thr Asn Lys Gln Ala Gln Glu Ile Val Asp Ile Glu Gly Asp Glu
115 120 125

Asn Asp Arg Gly Lys Arg Gln Ala Phe Arg Asp Arg Asn Tyr Pro Arg
130 135 140

Thr Leu Trp Ser Lys Gly Val Tyr Tyr Tyr Phe His Gly Asn Ala Thr
145 150 155 160

Pro Glu Val Arg Ser Val Phe Thr Lys Gly Ala Arg Leu Trp Met Lys
165 170 175

Asp Thr Cys Ile Asp Phe Phe Glu Ser Asn Ser Ala Pro Asp Arg Ile
180 185 190

Arg Val Phe Lys Glu Gln Gly Cys Trp Ser Tyr Val Gly Arg Ile Gly
195 200 205

Gly Gln Gln Asp Leu Ser Leu Gly Lys Gly Cys Glu Ser Val Gly Thr
210 215 220

Ala Ala His Glu Ile Gly His Ala Ile Gly Phe Tyr His Thr His Ser
225 230 235 240

Arg His Asp Arg Asp Asn Phe Ile Thr Phe Asn Ala Gln Asn Val Lys
245 250 255

Pro Asp Trp Leu Asp Gln Phe Thr Lys Gln Thr Pro Ala Thr Asn Glu
260 265 270

Asn Tyr Gly Ile Thr Tyr Asp Tyr Gly Ser Ile Met His Tyr Gly Ala
275 280 285

Asn Ser Ala Ser Ala Asn Gly Gln Pro Ser Met Val Pro Phe Asp Pro
290 295 300

Lys Tyr Val Glu Thr Leu Gly Ser Pro Ile Ile Ser Phe Tyr Glu Leu
305 310 315 320

Leu Met Ile Asn Lys Pro Tyr Glu Cys Thr Lys Asn Cys Asp Pro Asn
325 330 335

Thr Ser Ala Gln Cys Lys Met Gly Gly Phe Pro His Pro Arg Asp Cys
340 345 350

Gly Arg Cys Ile Cys Pro Ser Gly Tyr Gly Gly Gln Leu Cys Asp Gln
355 360 365

Lys Pro Ser Gly Cys Gly Ser Ile Leu Gln Ala Thr Ala Gln Tyr Gln
370 375 380

Asn Leu His Asp Lys Arg Gly Asn Glu Ala Ala Gly Gln Arg Pro Arg
385 390 395 400

Glu Asp Met Asp Phe Cys Tyr Tyr Trp Ile Thr Ala Pro Gln Gly Ser
405 410 415

Arg Ile Glu Ile Lys Ile Ala Asp Leu Ser Arg Gly Ala Ala Val Asp
420 425 430

Gly Cys Gln Tyr Trp Gly Val Glu Ile Lys Thr His Ala Asp Gln Arg
435 440 445

Leu Thr Gly Tyr Arg Phe Cys Ala Pro Glu Asp Val Gly Arg Thr Leu
450 455 460

Val Ser Asn Ser Asn Ile Val Pro Ile Ile Thr Tyr Asn Phe Tyr Ala
465 470 475 480

Thr Thr Val Asp Ile Gln Tyr Arg Ile Val Gly Gly Asn Val Gly Gly
485 490 495

Pro Arg Pro Gln Pro Gln Pro Asn Ser Asn Cys Val Asp Asn Glu Gln
500 505 510

Cys Ala Thr Leu Ile Arg Thr Lys Asn Phe Cys Gln Ser Arg Ser Phe
515 520 525

Thr Glu Ser Val Lys Arg Gly Leu Cys Pro Lys Ala Cys Gly Phe Cys
530 535 540

Arg
545

<210> 61
<211> 893
<212> DNA
<213> Ancylostoma ceylanicum

<400> 61
ggtttaatta cccaagtttg agatgaagct actcgctctt tccgctctct gcgcgctggc 60

cttcgctgct ccgcgagaca agcggctagc tgtgagcact atcactgtca ctggaggact 120

aggtctctcc acgggatgtg tcgtcactgg caacgttttg tatgcaaatg gtttccgagt 180

acgcgaaatt aatccatcgg agcagcaaga gttggtcaag tatcagaacg acgtagccga 240

atataagacg gccctgaaac aagcgatcaa ggagcgagaa gagaagatcc gagcccgtct 300

cgccggcaag aaggtgaagg ccgttgagtc gaccaaagaa gaggacctgc cgaagccgcc 360

acagaagccg tcattctgca caccagaaga cactacccag ttcttctttg aaggatgcat 420

gatccagaac aacaagatct acgtcggaaa cactttcgct cgtgacctga cccaatctga 480

aatcggcgaa ctgaaggaat tcgagaagaa attcaaggtc taccaggact acgttcagaa 540

gcaggccgaa cagcaagtga acagcctctt cggcggctct gacttcttct cggcactgtt 600

cagcggcggt gagaccaagc catccacgac cactgtggca ccagaacttc ctgaagacgc 660

tcccgagcag ccgcccacgc ccaacttctg caccagaata atctaaacgt gctctgaatt 720

gtccacttag ttgttggatt ggttggtttg gtgaatagcg acttcgcttc ccctctcgta 780

cttacggtgt cgactagcac attagtcatg cgttgcaata tttgatcatt gtattaaggt 840

atattgtaca tttatataat aaaattatat ttcaactcaa aaaaaaaaaa aaa 893

<210> 62
<211> 227
<212> PRT
<213> Ancylostoma ceylanicum

<400> 62

Met Lys Leu Leu Ala Leu Ser Ala Leu Cys Ala Leu Ala Phe Ala Ala
1 5 10 15

Pro Arg Asp Lys Arg Leu Ala Val Ser Thr Ile Thr Val Thr Gly Gly

20 25 30

Leu Gly Leu Ser Thr Gly Cys Val Val Thr Gly Asn Val Leu Tyr Ala
35 40 45

Asn Gly Phe Arg Val Arg Glu Ile Asn Pro Ser Glu Gln Gln Glu Leu
50 55 60

Val Lys Tyr Gln Asn Asp Val Ala Glu Tyr Lys Thr Ala Leu Lys Gln
65 70 75 80

Ala Ile Lys Glu Arg Glu Glu Lys Ile Arg Ala Arg Leu Ala Gly Lys
85 90 95

Lys Val Lys Ala Val Glu Ser Thr Lys Glu Glu Asp Leu Pro Lys Pro
100 105 110

Pro Gln Lys Pro Ser Phe Cys Thr Pro Glu Asp Thr Thr Gln Phe Phe
115 120 125

Phe Glu Gly Cys Met Ile Gln Asn Asn Lys Ile Tyr Val Gly Asn Thr
130 135 140

Phe Ala Arg Asp Leu Thr Gln Ser Glu Ile Gly Glu Leu Lys Glu Phe
145 150 155 160

Glu Lys Lys Phe Lys Val Tyr Gln Asp Tyr Val Gln Lys Gln Ala Glu
165 170 175

Gln Gln Val Asn Ser Leu Phe Gly Gly Ser Asp Phe Phe Ser Ala Leu
180 185 190

Phe Ser Gly Gly Glu Thr Lys Pro Ser Thr Thr Thr Val Ala Pro Glu
195 200 205

Leu Pro Glu Asp Ala Pro Glu Gln Pro Pro Thr Pro Asn Phe Cys Thr
210 215 220

Arg Ile Ile
225

<210> 63
<211> 407
<212> DNA
<213> Ancylostoma ceylanicum

<400> 63
ggttaattac ccaagtttga gaatgattca actgttgttg ttagcgctac tccctgtttg 60

catctcagtg agggaacagt cgatagcagt taaaggacgc cttctgtgcg gtgatcaacc 120

agcagcgaac gtcagagtga agttgtggga agaagacaca ggaccagatc cagatgacct 180

actggatgca ggatacacga actctaatgg tgaattccaa ctccaaggcg gaacaataga 240

gacgactccc attgatcccg tcttgaaaat ttaccatgat tgcaatgacg tgactggttt 300

tctgagcgta cctaaacctg gcagcagaaa agtgaggttc tccttaccgg acaaatacat 360

cagcgatgga atggttccta agaaagtcat ggacatcggt gttatca 407

<210> 64
<211> 127
<212> PRT
<213> Ancylostoma ceylanicum

<400> 64

Met Ile Gln Leu Leu Leu Leu Ala Leu Leu Pro Val Cys Ile Ser Val
1 5 10 15

Arg Glu Gln Ser Ile Ala Val Lys Gly Arg Leu Leu Cys Gly Asp Gln
20 25 30

Pro Ala Ala Asn Val Arg Val Lys Leu Trp Glu Glu Asp Thr Gly Pro
35 40 45

Asp Pro Asp Asp Leu Leu Asp Ala Gly Tyr Thr Asn Ser Asn Gly Glu
50 55 60

Phe Gln Leu Gln Gly Gly Thr Ile Glu Thr Thr Pro Ile Asp Pro Val
65 70 75 80

Leu Lys Ile Tyr His Asp Cys Asn Asp Val Thr Gly Phe Leu Ser Val
85 90 95

Pro Lys Pro Gly Ser Arg Lys Val Arg Phe Ser Leu Pro Asp Lys Tyr
100 105 110

Ile Ser Asp Gly Met Val Pro Lys Lys Val Met Asp Ile Gly Val
115 120 125

<210> 65
<211> 26
<212> DNA
<213> Artificial

<220>
<223> synthetic oligonucleotide primer

<400> 65
cttctcatga tcaacaaaca cvtacg 26

<210> 66
<211> 25
<212> DNA
<213> Artificial

<220>
<223> Synthetic oligonucleotide primer

<400> 66
aatctaactc caacatcttc tggtg 25

<210> 67
<211> 425
<212> PRT
<213> Ancylostoma duodenale

<400> 67

Met Phe Ser Ser Val Val Val Ile Ser Val Ile Ser Thr Ile Ala Phe
1 5 10 15

Cys Asp Ala Ser Pro Ala Arg Ala Ser Phe Gly Cys Ser Asn Asn Gly
20 25 30

Ile Thr Asp Ser Asp Arg Gln Ala Phe Leu Asp Phe His Asn Asn Ala
35 40 45

Arg Arg Arg Val Ala Gln Gly Val Glu Asp Asn Lys Ser Gly Lys Leu
50 55 60

Asn Pro Ala Lys Asn Met Tyr Lys Leu Glu Trp Asp Cys Lys Met Glu
65 70 75 80

Gln Gln Leu Gln Asp Ala Ile Gln Ser Cys Pro Gly Gly Ser Ala Gly
85 90 95

Ile Gln Gly Phe Ser Gln Asn Val Met Ser Trp Ser Asn Ser Gly Gly
100 105 110

Phe Pro Asn Ser Ser Glu Lys Ile Glu Ser Thr Leu Ser Gly Trp Trp
115 120 125

Ser Gly Ala Lys Asn Asn Gly Val Gly Ser Asp Asn Lys Tyr Thr Gly
130 135 140

Gly Gly Leu Tyr Ala Phe Ser Asn Met Val Phe Ser Glu Thr Thr Lys
145 150 155 160

Ile Gly Cys Ala Tyr Lys Val Cys Gly Thr Lys Met Ala Thr Ser Cys
165 170 175

Ile Tyr Asn Gly Ile Gly Tyr Ile Thr Asn Ala Pro Met Trp Glu Thr
180 185 190

Gly Gln Ala Cys Lys Thr Gly Ala Asp Cys Ser Thr Tyr Lys Asn Ser
195 200 205

Gly Cys Glu Asp Ser Leu Cys Thr Lys Gly Ala Asp Val Pro Glu Thr
210 215 220

Asn Gln Gln Cys Pro Ser Asn Thr Gly Met Thr Asp Ser Val Arg Asp
225 230 235 240

Thr Phe Leu Ser Leu His Asn Gly Phe Arg Ser Ser Val Ala Arg Gly
245 250 255

Leu Glu Pro Asp Ala Leu Gly Gly Asn Ala Pro Lys Ala Ala Lys Met
260 265 270

Leu Lys Met Val Tyr Asp Cys Glu Val Glu Ala Ser Ala Ile Arg His
275 280 285

Gly Asn Lys Cys Val Tyr Gln His Ser Ser Gly Asn Asp Arg Pro Gly
290 295 300

Leu Gly Glu Asn Ile Tyr Lys Thr Ser Val Gln Lys Phe Glu Lys Asn
305 310 315 320

Lys Ala Ala Lys Gln Ala Ser Glu Leu Trp Trp Asn Glu Leu Arg Glu
325 330 335

Phe Gly Val Gly Pro Ser Asn Asn Leu Thr Asn Ala Leu Trp Asn Arg
340 345 350

Pro Gly Met Gln Ile Gly His Tyr Thr Gln Met Ala Trp Asp Thr Thr
355 360 365

Tyr Lys Leu Gly Cys Ala Val Val Phe Cys Asn Asp Phe Thr Phe Gly
370 375 380

Val Cys Gln Tyr Gly Pro Gly Gly Asn Tyr Met Asn His Leu Ile Tyr
385 390 395 400

Thr Met Gly Gln Pro Cys Ser Gln Cys Ala Ala Thr Ala Thr Cys Ser
405 410 415

Val Thr Glu Gly Leu Cys Ser Ala Pro
420 425

<210> 68
<211> 216
<212> PRT
<213> Ancylostoma duodenale

<400> 68

Met Leu Val Pro Val Ala Leu Leu Ala Leu Leu Ala Val Ala Val Glu
1 5 10 15

Gly Asn Ser Met Arg Cys Gly Asn Asn Gly Met Thr Asp Glu Ala Arg
20 25 30

Gln Glu Phe Leu Asp Val His Asn Gly Tyr Arg Ser Lys Val Ala Lys

35 40 45

Gly Gln Ala Lys Asp Ala Leu Gly Gly Asn Ala Pro Lys Ala Ala Lys
50 55 60

Met Lys Lys Met Ile Tyr Asp Cys Asn Val Glu Ser Thr Ala Met Gln
65 70 75 80

Asp Ala Lys Lys Cys Val Phe Ala His Ser His Lys Gly Leu Gly Glu
85 90 95

Asn Ile Tyr Met Ser Thr Ala Arg Gln Met Asp Lys Ala Glu Ala Ala
100 105 110

Gln Gln Ala Ser Asp Gly Trp Phe Ala Glu Leu Ala Lys Tyr Gly Val
115 120 125

Gly Gln Glu Asn Lys Leu Thr Met Gln Leu Trp Asn Arg Gly Val Met
130 135 140

Ile Gly His Tyr Thr Gln Met Val Trp Gln Glu Ser Tyr Lys Leu Gly
145 150 155 160

Cys Tyr Val Glu Trp Cys Pro Ser Met Thr Tyr Gly Val Cys Gln Tyr
165 170 175

Ser Pro Gln Gly Asn Met Met Asn Ser Ile Ile Tyr Glu Lys Gly Asn
180 185 190

Pro Cys Thr Gln Asp Ser Asp Cys Gly Ser Asn Ala Lys Cys Ser Ser
195 200 205

Gly Glu Ala Leu Cys Ile Val Gln
210 215

<210> 69
<211> 207
<212> PRT
<213> Necator americanus

<400> 69

Met Ser Ser Ile Thr Cys Leu Val Leu Leu Ser Ile Ala Ala Tyr Ser
1 5 10 15

Lys Ala Gly Cys Pro Asp Asn Gly Met Ser Glu Glu Ala Arg Gln Lys
20 25 30

Phe Leu Glu Leu His Asn Ser Leu Arg Ser Ser Val Ala Leu Gly Gln
35 40 45

Ala Lys Asp Gly Ala Gly Gly Asn Ala Pro Lys Ala Ala Lys Met Lys
50 55 60

Thr Met Ala Tyr Asp Cys Glu Val Glu Lys Thr Ala Met Asn Asn Ala
65 70 75 80

Lys Gln Cys Val Phe Lys His Ser Gln Pro Asn Gln Arg Lys Gly Leu
85 90 95

Gly Glu Asn Ile Phe Met Ser Ser Asp Ser Gly Lys Ala Lys Ala Ala
100 105 110

Glu Gln Ala Ser Lys Ala Trp Phe Gly Glu Leu Ala Glu Lys Gly Val
115 120 125

Gly Gln Asn Leu Lys Leu Thr Gly Gly Leu Phe Ser Arg Gly Val Gly
130 135 140

His Tyr Thr Gln Met Val Trp Gln Glu Thr Val Lys Leu Gly Cys Tyr
145 150 155 160

Val Glu Ala Cys Ser Asn Met Cys Tyr Val Val Cys Gln Tyr Gly Pro
165 170 175

Ala Gly Asn Met Met Gly Lys Asp Ile Tyr Glu Lys Gly Glu Pro Cys
180 185 190

Ser Lys Cys Glu Asn Cys Asp Lys Glu Lys Gly Leu Cys Ser Ala
195 200 205

<210> 70
<211> 31
<212> DNA
<213> Artificial

<220>
<223> Synthetic oligonucleotide primer

<400> 70
ctctcgagaa aagaagccca gtaaagccag c 31

<210> 71
<211> 28
<212> DNA
<213> Artificial

<220>
<223> Synthetic oligonucleotide primer

<400> 71
tgtctagagg agcactgcac aatccttc 28

<210> 72
<211> 27
<212> DNA
<213> Artificial

<220>
<223> Synthetic oligonucleotide primer

<400> 72
gggaattcgg aaataatgga atgaccg 27

<210> 73
<211> 26
<212> DNA
<213> Artificial

<220>
<223> Snythetic oligonucleotide primer

<400> 73
tgtctagacc atgcacgatg caaagc 26

<210> 74
<211> 21
<212> DNA
<213> Artificial

<220>
<223> Synthetic oligonucleotide primer

<400> 74
gcaaatggca ttctgacatc c 21

<210> 75
<211> 21
<212> DNA
<213> Artificial

<220>
<223> Synthetic oligonucleotide primer

<400> 75
tactattgcc agcattgctg c 21

<210> 76
<211> 678

<212> DNA
<213> Ancylostoma caninum

<400> 76
gaaaggttta attacccaag tttgaggtgt aaaaatggtc cactacaagc tgacctactt 60

caacggacgt ggcctcggcg aatgcgcgcg tcagttgttc gctcttgctg accaacaata 120

tgaggatatt cgtgttacac atgaggattt ccccgagata aaaccaaatt tgccatttgg 180

acaactgccg ctgcttaacg aggatggtaa agaactcgct cagtcaaacg ccatcaatcg 240

ttacctggct aggaaattcg gattcgctgg caaaacgcca tttgaggagg ctctagtgga 300

ctcgctggca gatcagatga cggactaccg tgtagaaata aaaccattcg tctatacagc 360

gtatggacat cagaaattcg gtgacctgga gacgctaaaa aaggatgtga tgcttcctgc 420

acgagacaag ttcctcggtt tcatcaccaa attcttaaag aacaacccat caggattctt 480

ggttggtgac tcggtgactt ggatagatct gttgcttgct gaacatgctt ccgacataca 540

gtcaaaggtc cccgaatacc tcgaagggtt tcctgaggtg aaggctcata tggaaaaggt 600

gcgatctatt ccgaaactga aaaaatggat cgagaccaga ccggagactc acttctgatc 660

gatacgcggg attttttc 678

<210> 77
<211> 207
<212> PRT
<213> Ancylostoma caninum

<400> 77

Met Val His Tyr Lys Leu Thr Tyr Phe Asn Gly Arg Gly Leu Gly Glu
1 5 10 15

Cys Ala Arg Gln Leu Phe Ala Leu Ala Asp Gln Gln Tyr Glu Asp Ile
20 25 30

Arg Val Thr His Glu Asp Phe Pro Glu Ile Lys Pro Asn Leu Pro Phe

35 40 45

Gly Gln Leu Pro Leu Leu Asn Glu Asp Gly Lys Glu Leu Ala Gln Ser
50 55 60

Asn Ala Ile Asn Arg Tyr Leu Ala Arg Lys Phe Gly Phe Ala Gly Lys
65 70 75 80

Thr Pro Phe Glu Glu Ala Leu Val Asp Ser Leu Ala Asp Gln Met Thr
85 90 95

Asp Tyr Arg Val Glu Ile Lys Pro Phe Val Tyr Thr Ala Tyr Gly His
100 105 110

Gln Lys Phe Gly Asp Leu Glu Thr Leu Lys Lys Asp Val Met Leu Pro
115 120 125

Ala Arg Asp Lys Phe Leu Gly Phe Ile Thr Lys Phe Leu Lys Asn Asn
130 135 140

Pro Ser Gly Phe Leu Val Gly Asp Ser Val Thr Trp Ile Asp Leu Leu
145 150 155 160

Leu Ala Glu His Ala Ser Asp Ile Gln Ser Lys Val Pro Glu Tyr Leu
165 170 175

Glu Gly Phe Pro Glu Val Lys Ala His Met Glu Lys Val Arg Ser Ile
180 185 190

Pro Lys Leu Lys Lys Trp Ile Glu Thr Arg Pro Glu Thr His Phe
195 200 205

<210> 78
<211> 16

<212> DNA
<213> Artificial

<220>
<223> Synthetic oligonucleotide primer

<400> 78
gctctccggc tggtgg 16

<210> 79
<211> 21
<212> DNA
<213> Artificial

<220>
<223> Synthetic oligonucleotide primer

<400> 79
ttaaggagcg ctgcacaagc c 21

<210> 80
<211> 28
<212> DNA
<213> Artificial

<220>
<223> Synthetic oligonucleotide primer

<400> 80
gggaattcaa ttctatgaga tgcggaaa 28

<210> 81
<211> 28
<212> DNA
<213> Artificial

<220>
<223> Synthetic oligonucleotide primer

<400> 81
tgtctagata gccagccacg acgcaaag 28

<210> 82
<211> 753
<212> DNA
<213> Necator americanus

<400> 82
gaaaatcaca atgatgtctt ctatcacatg tttggttctt ctctcgattg cagcgtactc 60

caaagccggt tgtcctgaca atggaatgtc agaggaagca cggcaaaaat tccttgaatt 120

gcacaattcg ttgagaagtt cggttgcatt gggacaggcc aaggatggag ctggtggaaa 180

tgccccgaaa gctgctaaga tgaagacgat ggcatacgat tgcgaagttg aaaagactgc 240

aatgaataac gcgaaacaat gtgtattcaa gcactcgcaa cctaaccaaa ggaaaggatt 300

gggagagaat atatttatgt cttcggatag cggtatggac aaagcaaagg ctgctgagca 360

ggctagcaaa gcttggttcg gcgaacttgc agaaaaagga gttggacaga atcttaagct 420

tacaggaggc ttgttcagca gaggagtcgg gcactataca cagatggtat ggcaagaaac 480

cgttaagctt ggatgctatg tggaagcgtg ctcaaatatg tgttatgtgg tgtgccagta 540

cggtcctgct ggaaatatga tgggcaagga tatctacgag aaaggagaac cgtgttcgaa 600

atgtgagaat tgcgacaagg agaagggact ctgcagtgct tgattagttg tgttcagtga 660

agctcattac gctcacatac tttaacaaat cgtagtgatc tgtagttgct ttaatattca 720

aataaacatg atgccagcaa aaaaaaaaaa aaa 753

<210> 83
<211> 1134
<212> DNA
<213> Necator americanus

<400> 83
gttaaagccg tgtaagcaac agggttcttt gtgatgttaa ctctcgctgc acttctgatt 60

tctgtttcgc tggttgagcc gacaggcata ggtgagtttc ttgctcaacc agcacctgca 120

tatgctagaa gactcacagg gcaggccctt gttgactacg tcaattcgca ccactcattg 180

tacaaggcca aatattcacc agatgctcaa gaacgcatga aatctagaat tatggatttg 240

agtttcatgg ttgatgcgga agtcatgatg gaagaaatgg accagcagga ggatatagat 300

ctcgctgttt ctttacctga aagtttcgac gctcgtgaaa aatggccaga atgtccttca 360

ataggattaa tccgtgatca gtccgccggt ggaggatgtt gggcagtatc ctcagcagag 420

gtgatgaccg acaggatctg tatacaatca aatggaacaa agcaggtgta tgtttccgaa 480

acggatatct tatcatgctg tggacaacgt tgcggtagcg ggtgtacctc aggtgtgcca 540

cgtcaagctt tcaactatgc aattcgtaaa ggtgtttgca gtggaggacc atatggaacg 600

aagggtgttt gcaaacccta tcctttctat ccatgcggct atcatgctca tctgccatat 660

tatggaccat gtccagatgg tatgtggcct acgccaacat gcgaaaaggc atgtcaatcc 720

gactatactg ttccgtacaa cgatgacagg atcttcggca gcaaaactat tgtcttgacg 780

ggagaggaaa aaattaagcg agagattttc aataacggac cattggtagc cacgtataca 840

gtttacgaag atttcgctta ttacaagaat ggaatttaca tgactggtct cggtagagcg 900

acaggcgcac atgcagtcaa aattattggc tggggtgaag aaaatggagt caagtattgg 960

ttgattgcaa actcgtggaa cactgattgg ggagagaatg gcttcttccg catgcttcgt 1020

ggaacaaacc tttgcgatat tgaactaagc gcgactggag gaacgttcaa ggtgtgaacg 1080

tgatcgaaaa gaacgatttt gaacaaaaat cttcccgtat tgtcatcaaa aaaa 1134

<210> 84
<211> 347
<212> PRT
<213> Necator americanus

<400> 84

Met Leu Thr Leu Ala Ala Leu Leu Ile Ser Val Ser Leu Val Glu Pro
1 5 10 15

Thr Gly Ile Gly Glu Phe Leu Ala Gln Pro Ala Pro Ala Tyr Ala Arg
20 25 30

Arg Leu Thr Gly Gln Ala Leu Val Asp Tyr Val Asn Ser His His Ser
35 40 45

Leu Tyr Lys Ala Lys Tyr Ser Pro Asp Ala Gln Glu Arg Met Lys Ser
50 55 60

Arg Ile Met Asp Leu Ser Phe Met Val Asp Ala Glu Val Met Met Glu
65 70 75 80

Glu Met Asp Gln Gln Glu Asp Ile Asp Leu Ala Val Ser Leu Pro Glu
85 90 95

Ser Phe Asp Ala Arg Glu Lys Trp Pro Glu Cys Pro Ser Ile Gly Leu
100 105 110

Ile Arg Asp Gln Ser Ala Gly Gly Gly Cys Trp Ala Val Ser Ser Ala
115 120 125

Glu Val Met Thr Asp Arg Ile Cys Ile Gln Ser Asn Gly Thr Lys Gln
130 135 140

Val Tyr Val Ser Glu Thr Asp Ile Leu Ser Cys Cys Gly Gln Arg Cys
145 150 155 160

Gly Ser Gly Cys Thr Ser Gly Val Pro Arg Gln Ala Phe Asn Tyr Ala
165 170 175

Ile Arg Lys Gly Val Cys Ser Gly Gly Pro Tyr Gly Thr Lys Gly Val
180 185 190

Cys Lys Pro Tyr Pro Phe Tyr Pro Cys Gly Tyr His Ala His Leu Pro

195 200 205

Tyr Tyr Gly Pro Cys Pro Asp Gly Met Trp Pro Thr Pro Thr Cys Glu
210 215 220

Lys Ala Cys Gln Ser Asp Tyr Thr Val Pro Tyr Asn Asp Asp Arg Ile
225 230 235 240

Phe Gly Ser Lys Thr Ile Val Leu Thr Gly Glu Glu Lys Ile Lys Arg
245 250 255

Glu Ile Phe Asn Asn Gly Pro Leu Val Ala Thr Tyr Thr Val Tyr Glu
260 265 270

Asp Phe Ala Tyr Tyr Lys Asn Gly Ile Tyr Met Thr Gly Leu Gly Arg
275 280 285

Ala Thr Gly Ala His Ala Val Lys Ile Ile Gly Trp Gly Glu Glu Asn
290 295 300

Gly Val Lys Tyr Trp Leu Ile Ala Asn Ser Trp Asn Thr Asp Trp Gly
305 310 315 320

Glu Asn Gly Phe Phe Arg Met Leu Arg Gly Thr Asn Leu Cys Asp Ile
325 330 335

Glu Leu Ser Ala Thr Gly Gly Thr Phe Lys Val
340 345

<210> 85
<211> 1177
<212> DNA
<213> Necator americanus

<400> 85

ttaattctta ttgctctggt ggtgacggcg ttggctcaac agccgctttc actaaaggag 60

tatctggaac agccgatacc agaggaggca gagaatcttt ccggagaagc gtttgcggag 120

tttctgaaca aacgacaatc gtttttcacg gctaagtaca cgccaaatgc tttaaacatt 180

cttaaaatgc gtgtgatgga atcgagattc ctggacaatg aagaaggtga aatgctaaaa 240

gaggaggaca tggatttcag tgaagaaatt cctgttagtt ttgatgctcg agacaaatgg 300

cccaaatgca cctccatagg atttatccgt gatcaatcac actgtggttc atgctgggca 360

gtatcgtcag cagaaacgat gtcagatcga ctctgcgtgc aatcaaacgg tacaattaag 420

gtacttctat ccgatacgga catccttgcc tgttgcccga attgtggtgc tggatgtgga 480

ggaggccaca caattcgagc gtgggaatat tttaagaaca caggcgtttg cactggcgga 540

ctatatggaa caaaggattc ctgcaaacca tacgctttct atccatgtaa agacgaaagt 600

tacggaaagt gccccaagga ttcttttcca acaccaaaat gtcgaaaaat ttgtcagtat 660

aaatacagta agaagtacgc cgacgacaaa tactacgcga attccgcata tcgaattcca 720

cagaatgaga cgtggatcaa attggagatc atgagaaacg ggcctgtgac agcatcattc 780

aggatttatc cggattttgg gttttacgaa aaaggagttt atgtgacttc aggcggaagg 840

gaactaggtg ggcacgcgat taaaatcatt ggatggggaa cggaaaaagt aaacggaact 900

gacctacctt actggttgat tgctaactct tggggtactg actggggaga gaataacggc 960

tatttccgca tacttcgcgg acaaaatcac tgccaaatag aacagaaagt tatcgccggt 1020

atgataaaag taccacaacc gaaatccgcc ggtccaccac ttcaacccaa tccttcaagc 1080

tgaaccaagt tgtagtattg tccccatcaa tccaagcatt tcttggggtg atacttttac 1140

gaataaaaac tacattataa aaaaaaaaaa aaaaaaa 1177

<210> 86
<211> 360
<212> PRT
<213> Necator americanus

<400> 86

Leu Ile Leu Ile Ala Leu Val Val Thr Ala Leu Ala Gln Gln Pro Leu
1 5 10 15

Ser Leu Lys Glu Tyr Leu Glu Gln Pro Ile Pro Glu Glu Ala Glu Asn
20 25 30

Leu Ser Gly Glu Ala Phe Ala Glu Phe Leu Asn Lys Arg Gln Ser Phe
35 40 45

Phe Thr Ala Lys Tyr Thr Pro Asn Ala Leu Asn Ile Leu Lys Met Arg
50 55 60

Val Met Glu Ser Arg Phe Leu Asp Asn Glu Glu Gly Glu Met Leu Lys
65 70 75 80

Glu Glu Asp Met Asp Phe Ser Glu Glu Ile Pro Val Ser Phe Asp Ala
85 90 95

Arg Asp Lys Trp Pro Lys Cys Thr Ser Ile Gly Phe Ile Arg Asp Gln
100 105 110

Ser His Cys Gly Ser Cys Trp Ala Val Ser Ser Ala Glu Thr Met Ser
115 120 125

Asp Arg Leu Cys Val Gln Ser Asn Gly Thr Ile Lys Val Leu Leu Ser
130 135 140

Asp Thr Asp Ile Leu Ala Cys Cys Pro Asn Cys Gly Ala Gly Cys Gly
145 150 155 160

Gly Gly His Thr Ile Arg Ala Trp Glu Tyr Phe Lys Asn Thr Gly Val
165 170 175

Cys Thr Gly Gly Leu Tyr Gly Thr Lys Asp Ser Cys Lys Pro Tyr Ala
180 185 190

Phe Tyr Pro Cys Lys Asp Glu Ser Tyr Gly Lys Cys Pro Lys Asp Ser
195 200 205

Phe Pro Thr Pro Lys Cys Arg Lys Ile Cys Gln Tyr Lys Tyr Ser Lys
210 215 220

Lys Tyr Ala Asp Asp Lys Tyr Tyr Ala Asn Ser Ala Tyr Arg Ile Pro
225 230 235 240

Gln Asn Glu Thr Trp Ile Lys Leu Glu Ile Met Arg Asn Gly Pro Val
245 250 255

Thr Ala Ser Phe Arg Ile Tyr Pro Asp Phe Gly Phe Tyr Glu Lys Gly
260 265 270

Val Tyr Val Thr Ser Gly Gly Arg Glu Leu Gly Gly His Ala Ile Lys
275 280 285

Ile Ile Gly Trp Gly Thr Glu Lys Val Asn Gly Thr Asp Leu Pro Tyr
290 295 300

Trp Leu Ile Ala Asn Ser Trp Gly Thr Asp Trp Gly Glu Asn Asn Gly
305 310 315 320

Tyr Phe Arg Ile Leu Arg Gly Gln Asn His Cys Gln Ile Glu Gln Lys
325 330 335

Val Ile Ala Gly Met Ile Lys Val Pro Gln Pro Lys Ser Ala Gly Pro
340 345 350

Pro Leu Gln Pro Asn Pro Ser Ser
355 360

<210> 87
<211> 1181
<212> DNA
<213> Necator americanus

<400> 87
tcgttgaggc gttatttcaa gcttctctcg cctcgatttc agattctcca attgtttcag 60

tgaatcgtgg aacagtcaat ctcacttttg tgagatccaa tgaaagctaa ttttgcgttg 120

gtcgtcgtcc ttctggcaat aaaccagtta tatgcagatg agctgcttca caaacaagag 180

tccgaacacg gacttagtgg ccaagcgctc gttgactacg ttaattcgca ccaatcactt 240

ttcaaaacag aatattcgcc aaccaatgaa caattcgtta aagcccgtat aatggacata 300

aagtatatga ctgaggctag ccacaaatat ccaagaaagg gcattaatct gaacgttgaa 360

ctccctgaaa ggtttgacgc acgtgaaaaa tggccacatt gcgcctccat cggtctcatt 420

cgcgatcact ctgcttgcgg atcgtgttgg gctgtatcgg cagcgtcggt tatgtcagat 480

cgactctgta tccagacgaa cggcacaaac cagaagatcc tttcgtcggc ggacatcctt 540

gcgtgttgtg gagaagactg tggctcagga tgcgaaggcg gttatccgat tcaggcgtac 600

ttctacctgg aaaatactgg agtatgtagt ggaggagagt atcgagaaaa gaatgtatgc 660

aaaccatatc ccttttatcc gtgtgacgga aactatggac catgccccaa ggagggtgcg 720

ttcgacactc caaagtgtcg gaaaatatgt cagttccgat atcctgttcc atacgaagaa 780

gataaagtgt ttggaaaaaa ttcacacatc cttctgcaag acaacgaggc aagaatcaga 840

caggaaattt tcataaacgg accagtggga gctaattttt acgttttcga agactttata 900

cactacaagg aagggattta taagcagaca tatgggaaat ggataggagt acatgcaatc 960

aaacttattg gttggggcac agaaaatgga acagattatt ggttggttgc taactcgtac 1020

aactacgact ggggagagaa tggcaccttc cgcattcttc gtggaactaa tcactgtttg 1080

atagaatcac aagtgatcgc aacggagatg attgtatgaa tgtctaatga acgattggtc 1140

gcatgccgat ctctgaagta aaatgtgtta atcaaaaaaa a 1181

<210> 88
<211> 339
<212> PRT
<213> Necator americanus

<400> 88

Met Lys Ala Asn Phe Ala Leu Val Val Val Leu Leu Ala Ile Asn Gln
1 5 10 15

Leu Tyr Ala Asp Glu Leu Leu His Lys Gln Glu Ser Glu His Gly Leu
20 25 30

Ser Gly Gln Ala Leu Val Asp Tyr Val Asn Ser His Gln Ser Leu Phe
35 40 45

Lys Thr Glu Tyr Ser Pro Thr Asn Glu Gln Phe Val Lys Ala Arg Ile
50 55 60

Met Asp Ile Lys Tyr Met Thr Glu Ala Ser His Lys Tyr Pro Arg Lys
65 70 75 80

Gly Ile Asn Leu Asn Val Glu Leu Pro Glu Arg Phe Asp Ala Arg Glu
85 90 95

Lys Trp Pro His Cys Ala Ser Ile Gly Leu Ile Arg Asp His Ser Ala
100 105 110

Cys Gly Ser Cys Trp Ala Val Ser Ala Ala Ser Val Met Ser Asp Arg
115 120 125

Leu Cys Ile Gln Thr Asn Gly Thr Asn Gln Lys Ile Leu Ser Ser Ala
130 135 140

Asp Ile Leu Ala Cys Cys Gly Glu Asp Cys Gly Ser Gly Cys Glu Gly
145 150 155 160

Gly Tyr Pro Ile Gln Ala Tyr Phe Tyr Leu Glu Asn Thr Gly Val Cys
165 170 175

Ser Gly Gly Glu Tyr Arg Glu Lys Asn Val Cys Lys Pro Tyr Pro Phe
180 185 190

Tyr Pro Cys Asp Gly Asn Tyr Gly Pro Cys Pro Lys Glu Gly Ala Phe
195 200 205

Asp Thr Pro Lys Cys Arg Lys Ile Cys Gln Phe Arg Tyr Pro Val Pro
210 215 220

Tyr Glu Glu Asp Lys Val Phe Gly Lys Asn Ser His Ile Leu Leu Gln
225 230 235 240

Asp Asn Glu Ala Arg Ile Arg Gln Glu Ile Phe Ile Asn Gly Pro Val
245 250 255

Gly Ala Asn Phe Tyr Val Phe Glu Asp Phe Ile His Tyr Lys Glu Gly
260 265 270

Ile Tyr Lys Gln Thr Tyr Gly Lys Trp Ile Gly Val His Ala Ile Lys
275 280 285

Leu Ile Gly Trp Gly Thr Glu Asn Gly Thr Asp Tyr Trp Leu Val Ala
290 295 300

Asn Ser Tyr Asn Tyr Asp Trp Gly Glu Asn Gly Thr Phe Arg Ile Leu
305 310 315 320

Arg Gly Thr Asn His Cys Leu Ile Glu Ser Gln Val Ile Ala Thr Glu
325 330 335

Met Ile Val

<210> 89
<211> 1236
<212> DNA
<213> Necator americanus

<400> 89
tagataataa tctttttgca cgtcagagaa tttctttgat aaaaccacaa ttaaacaatc 60

tcagcgctgt aaacacgtgc aaaactactc gttcatttct cttcactttc cctccaaaac 120

caaacattca agagaagcat gataaccatc attaccctat tgcttatcgc ttctacagtg 180

aagtcactaa cagtggagga gtacttggcc cgaccagtgc cggaatatgc cacaaaactg 240

acaggacaag cctacgttga ctatgttaat cagcatcaat cattctacaa ggctgaatat 300

tccccgctgg ttgaacagta tgccaaagct gtgatgagat ctgagtttat gacgaagccg 360

aaccaaaatt atgtggtgaa ggacgtagat ctaaacatca atcttccaga aaccttcgac 420

gcaagggaaa aatggccaaa ctgcacatca ataaggacaa ttcgcgatca gtccaattgt 480

ggatcatgtt gggcagtatc agcggcgtcg gtaatgtcag atcgtttatg catacagtcg 540

aacggcacaa tacagtcatg ggcttctgat acggatattc tatcatgttg ctggaattgc 600

ggaatgggat gcgatggagg tagaccgttt gcggcgttct ttttcgcgat agacaatggt 660

gtatgcactg gaggaccttt cagagagcca aacgtgtgca aaccatacgc tttctatcca 720

tgcggtcgcc accaaaacca gaaatacttc ggaccttgtc caaaagagct ctggcccact 780

ccaaaatgtc ggaaaatgtg tcaactaaaa tataatgtgg cctacaaaga cgataaaatt 840

tacgggaatg atgcatacag tctccctaac aatgagacac gaatcatgca agaaattttc 900

acaaatggac ctgtagtggg atcattcagc gtgtttgctg actttgcaat ttataagaaa 960

ggagtatatg tgagtaatgg aattcagcag aatggggctc atgcagtcaa aattattggt 1020

tggggtgtgc aggatggact aaaatattgg ttgattgcta attcctggaa caatgactgg 1080

ggagacgaag gctatgtccg gttccttcgt ggagataacc actgtggaat tgaatcaagg 1140

gtggtgacag gaactatgaa agtgtaaaac aataattagt cttttcctga cgatttcaaa 1200

taaaatcttt gccactaaaa aaaaaaaaaa aaaaaa 1236

<210> 90
<211> 342
<212> PRT
<213> Necator americanus

<400> 90

Met Ile Thr Ile Ile Thr Leu Leu Leu Ile Ala Ser Thr Val Lys Ser
1 5 10 15

Leu Thr Val Glu Glu Tyr Leu Ala Arg Pro Val Pro Glu Tyr Ala Thr
20 25 30

Lys Leu Thr Gly Gln Ala Tyr Val Asp Tyr Val Asn Gln His Gln Ser
35 40 45

Phe Tyr Lys Ala Glu Tyr Ser Pro Leu Val Glu Gln Tyr Ala Lys Ala
50 55 60

Val Met Arg Ser Glu Phe Met Thr Lys Pro Asn Gln Asn Tyr Val Val
65 70 75 80

Lys Asp Val Asp Leu Asn Ile Asn Leu Pro Glu Thr Phe Asp Ala Arg
85 90 95

Glu Lys Trp Pro Asn Cys Thr Ser Ile Arg Thr Ile Arg Asp Gln Ser
100 105 110

Asn Cys Gly Ser Cys Trp Ala Val Ser Ala Ala Ser Val Met Ser Asp
115 120 125

Arg Leu Cys Ile Gln Ser Asn Gly Thr Ile Gln Ser Trp Ala Ser Asp
130 135 140

Thr Asp Ile Leu Ser Cys Cys Trp Asn Cys Gly Met Gly Cys Asp Gly
145 150 155 160

Gly Arg Pro Phe Ala Ala Phe Phe Phe Ala Ile Asp Asn Gly Val Cys
165 170 175

Thr Gly Gly Pro Phe Arg Glu Pro Asn Val Cys Lys Pro Tyr Ala Phe
180 185 190

Tyr Pro Cys Gly Arg His Gln Asn Gln Lys Tyr Phe Gly Pro Cys Pro
195 200 205

Lys Glu Leu Trp Pro Thr Pro Lys Cys Arg Lys Met Cys Gln Leu Lys
210 215 220

Tyr Asn Val Ala Tyr Lys Asp Asp Lys Ile Tyr Gly Asn Asp Ala Tyr
225 230 235 240

Ser Leu Pro Asn Asn Glu Thr Arg Ile Met Gln Glu Ile Phe Thr Asn
245 250 255

Gly Pro Val Val Gly Ser Phe Ser Val Phe Ala Asp Phe Ala Ile Tyr
260 265 270

Lys Lys Gly Val Tyr Val Ser Asn Gly Ile Gln Gln Asn Gly Ala His
275 280 285

Ala Val Lys Ile Ile Gly Trp Gly Val Gln Asp Gly Leu Lys Tyr Trp
290 295 300

Leu Ile Ala Asn Ser Trp Asn Asn Asp Trp Gly Asp Glu Gly Tyr Val
305 310 315 320

Arg Phe Leu Arg Gly Asp Asn His Cys Gly Ile Glu Ser Arg Val Val
325 330 335

Thr Gly Thr Met Lys Val
340

<210> 91
<211> 2709
<212> DNA
<213> Necator americanus

<400> 91
attttcaatg accaagctcc tcgtaagcac cgccgggttg actggcgtcg tcgcggccct 60

cttcatcact tctctggttt tcagcatcct tacatggaca cgtgtaaaaa atgacaacga 120

taacccacca agacctaagg agccactcag tcgtccagta gtgcaattgt cttcatctat 180

tcagactacc gtaaccgaaa atgtagtgac agaacccata gtgactgtgc cgacagtgtc 240

acgcaccaga gtttcggcaa aaacaatatc accgagaagt tccgcgacaa cgtcaactcg 300

aacgcttcga actctcacca caccgaaatt cgtcgcaacg gaggccgcac cgcgacgtaa 360

tcgtacgata atgtgtccga actatggagt ttcagacaac tcatacgcat accaggaagc 420

agcatcgttc attcttagtg gcctcgacga acgtgtcaat ccgtgcgaag atttctacgc 480

tttcacttgt aacaagtttc taaaagatca taaggctgaa gaacatgggg tcagtcgtta 540

cggagctata aaagaacttc aagatgcagt gaacacagaa atagttgacg ccctcttcga 600

tgtggatgtg aacgataaga agcggtcaga aacagagaga ataacgaaag cgcttctcca 660

cgactgcgtt taccacatct cgcctaatgt tccgaccgaa acaatcatta atttccttga 720

agaaattgca agaatgtttg gaggtatacc gttcctcaac cacactctaa aagaagattt 780

tgacgttttc gctgcaatgg gagaagtcga acaaaatcac gcgatgggta cgcttttcag 840

cgcaatggtt tcggtcgact acaagaagat caaacagaat tcactgttct tatcacagcc 900

tcggcttccg atgccaagag aattctacgt gcttccacag tttacgatga agcttaaaaa 960

acgtggactt caaattgctg acgttttaaa gaaatttgcc gagaagatct tagaagaacc 1020

cgataagtat agggatatga tagaaaaggc tgcgcaagat gttgtggaac tagagaggag 1080

gatcgctctg gcgtcttggg cagatgccga aatgagaaac tacgcacaac agtacaatcc 1140

ctacgatctg cccactttga aaaaggcgta tccatctgtc aaatgggaga gctatctacg 1200

tagccttttg tcaaccgtcg gtccagtcga ttttttctggt ccacataaac ggctcataat 1260

ctcgcaaccg tcgtattttg ggtggttgaa tgctctcttc aatggtaacg ttgttgacga 1320

aaatacgata gtaaactata taatcacgca cttaatcttc gaagatgcgg aattccttgg 1380

tggtatattt aaagaatctg cagaggattt aaattacgtc cggtatgcgc agagaagtgg 1440

cagaggagtt gcccgagttg gaaggcaact tatgcatcaa agagatacca ggggcgaccc 1500

gaatatcccg tgcatgaatt tcatcatgac gtacatgccg tatggacctg gttatgtcta 1560

tgtaagaagc aaacagcaga gaaacgatgt tcaagcagac attaggaaac aaacagaact 1620

cgtcatcgag agctttctga atatgacttc gggcctgaag tggatgtctt cggattcgaa 1680

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aatccttgag cttaccaaga cggagaggag cagccttcga tattaccgta tgcgccgggt 1860

gctgattaaa ggatattcaa atcgcgagtc actgcgttta cttttgcagg atgcagacag 1920

gtccaatttc ctcctatcac cagcgttagt gagcgcctgg taccagccgg aaaggaactc 1980

tatcactttc ccttacgcga gcttcaatcc accgtactat agctatgaat atcctcaagc 2040

ttacaactat ggtggtcagg gtggaactgc cggtcatgag ctagtccatg gatttgacga 2100

ccaaggagtg cagttcggtc ccgatggaag tctaagtagg tgtacgtggt atgattgtgg 2160

atggatggat aaaagatcaa aagatggttt caacgacatg gcccaatgtg ttgtaacaca 2220

ttatagcact ttctgctgcc cagaacagga aggtaatata cactgcgcaa atggtgcaac 2280

cacacaaggg gaaaatattg ctgatattgg aggtgaacat gctgcataca tagcatatcg 2340

agagtacatc aaatcactag gacatgaaga gaaaagattg ccaggattag aacgatacac 2400

accaaaccag atcttttgga ttacatatgg atactcatgg tgcaggagcg taacagagga 2460

ataccttatt agtcaacttc tcaccgaccc ccacgcacca agtgcttgcc gcactaacca 2520

agtagtccaa agtatccctg cgtttggacg ggatttcggg tgctcattag gagacagaat 2580

gtatcctgca ccagagcagc gatgttcagt ttgggttcaa gagtaaatgg tcggacgaaa 2640

ctgtcggatt ttatgtttca gtcggattat aacactatca actaaacatt tcgttcaaaa 2700

aaaaaaaaa 2709

<210> 92
<211> 878
<212> PRT
<213> Necator americanus

<400> 92

Met Thr Lys Leu Leu Val Ser Thr Ala Gly Leu Thr Gly Val Val Ala
1 5 10 15

Ala Leu Phe Ile Thr Ser Leu Val Phe Ser Ile Leu Thr Trp Thr Arg
20 25 30

Val Lys Asn Asp Asn Asp Asn Pro Pro Arg Pro Lys Glu Pro Leu Ser
35 40 45

Arg Pro Val Val Gln Leu Ser Ser Ser Ile Gln Thr Thr Val Thr Glu
50 55 60

Asn Val Val Thr Glu Pro Ile Val Thr Val Pro Thr Val Ser Arg Thr
65 70 75 80

Arg Val Ser Ala Lys Thr Ile Ser Pro Arg Ser Ser Ala Thr Thr Ser
85 90 95

Thr Arg Thr Leu Arg Thr Leu Thr Thr Pro Lys Phe Val Ala Thr Glu
100 105 110

Ala Ala Pro Arg Arg Asn Arg Thr Ile Met Cys Pro Asn Tyr Gly Val
115 120 125

Ser Asp Asn Ser Tyr Ala Tyr Gln Glu Ala Ala Ser Phe Ile Leu Ser
130 135 140

Gly Leu Asp Glu Arg Val Asn Pro Cys Glu Asp Phe Tyr Ala Phe Thr
145 150 155 160

Cys Asn Lys Phe Leu Lys Asp His Lys Ala Glu Glu His Gly Val Ser
165 170 175

Arg Tyr Gly Ala Ile Lys Glu Leu Gln Asp Ala Val Asn Thr Glu Ile
180 185 190

Val Asp Ala Leu Phe Asp Val Asp Val Asn Asp Lys Lys Arg Ser Glu
195 200 205

Thr Glu Arg Ile Thr Lys Ala Leu Leu His Asp Cys Val Tyr His Ile

210 215 220

Ser Pro Asn Val Pro Thr Glu Thr Ile Ile Asn Phe Leu Glu Glu Ile
225 230 235 240

Ala Arg Met Phe Gly Gly Ile Pro Phe Leu Asn His Thr Leu Lys Glu
245 250 255

Asp Phe Asp Val Phe Ala Ala Met Gly Glu Val Glu Gln Asn His Ala
260 265 270

Met Gly Thr Leu Phe Ser Ala Met Val Ser Val Asp Tyr Lys Lys Ile
275 280 285

Lys Gln Asn Ser Leu Phe Leu Ser Gln Pro Arg Leu Pro Met Pro Arg
290 295 300

Glu Phe Tyr Val Leu Pro Gln Phe Thr Met Lys Leu Lys Lys Arg Gly
305 310 315 320

Leu Gln Ile Ala Asp Val Leu Lys Lys Phe Ala Glu Lys Ile Leu Glu
325 330 335

Glu Pro Asp Lys Tyr Arg Asp Met Ile Glu Lys Ala Ala Gln Asp Val
340 345 350

Val Glu Leu Glu Arg Arg Ile Ala Leu Ala Ser Trp Ala Asp Ala Glu
355 360 365

Met Arg Asn Tyr Ala Gln Gln Tyr Asn Pro Tyr Asp Leu Pro Thr Leu
370 375 380

Lys Lys Ala Tyr Pro Ser Val Lys Trp Glu Ser Tyr Leu Arg Ser Leu
385 390 395 400

Leu Ser Thr Val Gly Pro Val Asp Phe Ser Gly Pro His Lys Arg Leu
405 410 415

Ile Ile Ser Gln Pro Ser Tyr Phe Gly Trp Leu Asn Ala Leu Phe Asn
420 425 430

Gly Asn Val Val Asp Glu Asn Thr Ile Val Asn Tyr Ile Ile Thr His
435 440 445

Leu Ile Phe Glu Asp Ala Glu Phe Leu Gly Gly Ile Phe Lys Glu Ser
450 455 460

Ala Glu Asp Leu Asn Tyr Val Arg Tyr Ala Gln Arg Ser Gly Arg Gly
465 470 475 480

Val Ala Arg Val Gly Arg Gln Leu Met His Gln Arg Asp Thr Arg Gly
485 490 495

Asp Pro Asn Ile Pro Cys Met Asn Phe Ile Met Thr Tyr Met Pro Tyr
500 505 510

Gly Pro Gly Tyr Val Tyr Val Arg Ser Lys Gln Gln Arg Asn Asp Val
515 520 525

Gln Ala Asp Ile Arg Lys Gln Thr Glu Leu Val Ile Glu Ser Phe Leu
530 535 540

Asn Met Thr Ser Gly Leu Lys Trp Met Ser Ser Asp Ser Lys Glu Lys
545 550 555 560

Ala Arg Gln Lys Ala Lys Gly Met Val Arg Asn Tyr Gly Trp Pro Gln
565 570 575

Lys Leu Phe Gly Asp Phe Lys Ser Ser Glu Glu Ile Asp Glu Tyr His
580 585 590

Lys Lys Asp Tyr Ala Glu Ile Leu Glu Leu Thr Lys Thr Glu Arg Ser
595 600 605

Ser Leu Arg Tyr Tyr Arg Met Arg Arg Val Leu Ile Lys Gly Tyr Ser
610 615 620

Asn Arg Glu Ser Leu Arg Leu Leu Leu Gln Asp Ala Asp Arg Ser Asn
625 630 635 640

Phe Leu Leu Ser Pro Ala Leu Val Ser Ala Trp Tyr Gln Pro Glu Arg
645 650 655

Asn Ser Ile Thr Phe Pro Tyr Ala Ser Phe Asn Pro Pro Tyr Tyr Ser
660 665 670

Tyr Glu Tyr Pro Gln Ala Tyr Asn Tyr Gly Gly Gln Gly Gly Thr Ala
675 680 685

Gly His Glu Leu Val His Gly Phe Asp Asp Gln Gly Val Gln Phe Gly
690 695 700

Pro Asp Gly Ser Leu Ser Arg Cys Thr Ser Glu Gln Ile Asp Asn Trp
705 710 715 720

Tyr Asp Cys Gly Trp Met Asp Lys Arg Ser Lys Asp Gly Phe Asn Asp
725 730 735

Met Ala Gln Cys Val Val Thr His Tyr Ser Thr Phe Cys Cys Pro Glu
740 745 750

Gln Glu Gly Asn Ile His Cys Ala Asn Gly Ala Thr Thr Gln Gly Glu
755 760 765

Asn Ile Ala Asp Ile Gly Gly Glu His Ala Ala Tyr Ile Ala Tyr Arg
770 775 780

Glu Tyr Ile Lys Ser Leu Gly His Glu Glu Lys Arg Leu Pro Gly Leu
785 790 795 800

Glu Arg Tyr Thr Pro Asn Gln Ile Phe Trp Ile Thr Tyr Gly Tyr Ser
805 810 815

Trp Cys Arg Ser Val Thr Glu Glu Tyr Leu Ile Ser Gln Leu Leu Thr
820 825 830

Asp Pro His Ala Pro Ser Ala Cys Arg Thr Asn Gln Val Val Gln Ser
835 840 845

Ile Pro Ala Phe Gly Arg Asp Phe Gly Cys Ser Leu Gly Asp Arg Met
850 855 860

Tyr Pro Ala Pro Glu Gln Arg Cys Ser Val Trp Val Gln Glu
865 870 875

<210> 93
<211> 551
<212> DNA
<213> Ancylostoma caninum

<400> 93
gaaaagccta cgcagtcatg ctcaaactcg tcgccctagc ctgcttagct gcgatctgcc 60

tcgctcaggg tggacccgaa ggacccccctc ctttcctgaa gagtgctccc cccgagaagg 120

tgaaggaatt cgacgctctt ttcgccgatg ctggaggtct gactgatgcc cagatcgacg 180

ctaaggtcaa gggatggatc ggaaagcaga gtcaggatat ccagaacgca ttcaatgcct 240

tcgagagtga ggtgaaagcc gcccagcaac agggtgagca agctcaccag gctgctgtcg 300

ccaaattcag cgctgaagcc aaggctgccg acgccaagct caccgctatc gccaatgacg 360

cctccaagac gaatgcacag aagggagccg agatcgacgc cgttctcaag ggtcttccac 420

aaaaagtccg tgatgaaatc gagaatgcaa tgaagggata agagggcgtt gttttgtata 480

tatgaaccga taaatatgca aaataaatat ctccccttca aaaaaaaaaa aaaaaaaaaa 540

aaaaaaaaaa a 551

<210> 94
<211> 147
<212> PRT
<213> Ancylostoma caninum

<400> 94

Met Leu Lys Leu Val Ala Leu Ala Cys Leu Ala Ala Ile Cys Leu Ala
1 5 10 15

Gln Gly Gly Pro Glu Gly Pro Pro Pro Phe Leu Lys Ser Ala Pro Pro
20 25 30

Glu Lys Val Lys Glu Phe Asp Ala Leu Phe Ala Asp Ala Gly Gly Leu
35 40 45

Thr Asp Ala Gln Ile Asp Ala Lys Val Lys Gly Trp Ile Gly Lys Gln
50 55 60

Ser Gln Asp Ile Gln Asn Ala Phe Asn Ala Phe Glu Ser Glu Val Lys
65 70 75 80

Ala Ala Gln Gln Gln Gly Glu Gln Ala His Gln Ala Ala Val Ala Lys
85 90 95

Phe Ser Ala Glu Ala Lys Ala Ala Asp Ala Lys Leu Thr Ala Ile Ala
100 105 110

Asn Asp Ala Ser Lys Thr Asn Ala Gln Lys Gly Ala Glu Ile Asp Ala
115 120 125

Val Leu Lys Gly Leu Pro Gln Lys Val Arg Asp Glu Ile Glu Asn Ala
130 135 140

Met Lys Gly
145

<210> 95
<211> 482
<212> DNA
<213> Ancylostoma ceylanicum

<400> 95
cagtcatgct caaactcgtc gccctagcct gcttagctgc tatctgcctc gctcagggtg 60

gacccgaggg acccccctcct ttcctgaaga gtgctccccc cgagaaagtg aaggaattcg 120

acgctctttt cgccgatgct ggaggtctga ctgatgccca gatcgacgct aaggtcaagg 180

gatggatcgg aaagcagagc caggacatcc agaatgcatt caatgccttc gagagtgagg 240

tgaaagccgc ccagcaacag ggtgagcaag ctcaccaggc tgctgtcgcc aaattcagcg 300

ctgaggccaa ggctgccgac gccaagctca ccgctatcgc caatgacgcc tccaagacga 360

atgcgcagaa gggagccgag atcgacgccg ttctcaaggg tcttccacaa aaagtccgtg 420

atgaaatcga gaatgcaatg aagggataag agggcgttgt tttgtatata tgaaccgata 480

aa 482

<210> 96
<211> 147
<212> PRT
<213> Ancylostoma ceylanicum

<400> 96

Met Leu Lys Leu Val Ala Leu Ala Cys Leu Ala Ala Ile Cys Leu Ala
1 5 10 15

Gln Gly Gly Pro Glu Gly Pro Pro Pro Phe Leu Lys Ser Ala Pro Pro
20 25 30

Glu Lys Val Lys Glu Phe Asp Ala Leu Phe Ala Asp Ala Gly Gly Leu
35 40 45

Thr Asp Ala Gln Ile Asp Ala Lys Val Lys Gly Trp Ile Gly Lys Gln
50 55 60

Ser Gln Asp Ile Gln Asn Ala Phe Asn Ala Phe Glu Ser Glu Val Lys
65 70 75 80

Ala Ala Gln Gln Gln Gly Glu Gln Ala His Gln Ala Ala Val Ala Lys
85 90 95

Phe Ser Ala Glu Ala Lys Ala Ala Asp Ala Lys Leu Thr Ala Ile Ala
100 105 110

Asn Asp Ala Ser Lys Thr Asn Ala Gln Lys Gly Ala Glu Ile Asp Ala
115 120 125

Val Leu Lys Gly Leu Pro Gln Lys Val Arg Asp Glu Ile Glu Asn Ala
130 135 140

Met Lys Gly
145

<210> 97
<211> 1093

<212> DNA
<213> Ancylostoma caninum

<400> 97
tttgagatgt ggattctcgc tgcattagtg gtaacggcac ttgccgcaaa accgactacg 60

gttgaggagt tccacgctca acctatagag gagcacgtta aagacctcag tggacaagct 120

tttgttgact acatcaacga gcatcaatct ttctataggg cggaatattc accagaggcg 180

gaagcgttcg tgaaagctcg gataatggac tcgaagtatt tagtggaacc taagaaagaa 240

gaagtgctgg aggacgtata tggcaatgat ccgcctgcga gcttcgacgc tcgcacccac 300

tggcctgaat gcagatccat tggcaccatt cgtgaccagt catcatgcgg ttcatgttgg 360

gcagtatcct cagcggaagc catgtcggat gaaatatgtg ttcagtcgaa cagtacgata 420

agggtgatga tttccgactc agatatactc tcgtgctgtg gaatttcctg tggatatgga 480

tgccaaggtg gttggccgat cgaagcatac aaatggatgc aacgtgacgg tgttgttaca 540

ggtggaaaat acagacagaa gaaagtgtgc aagccgtacg ccttctatcc gtgtgggcac 600

caccaaaatg acccctacta tggaccttgc ccaggggttt tatggcccac tccaaaatgt 660

cgaaagacgt gtcagcgaaa atacaacaag tcctaccaag aagacaagca ctttgcaacg 720

agggcctact acctcccgaa taatgaaagg aacatcaggc aagagattta caagaacgga 780

cctgtggtcg cagctttcag agtctaccag gacttcagtt attacaaaaa aggaatctat 840

gtgcacaagt ggggtggtca aacaggagca catgctgtca aagtcgttgg ttggggcaga 900

gaaaatgcaa cagattactg gctgattgcg aactcgtgga acactgactg gggagaaagc 960

ggctatttcc gtattgttcg tggaactaac gagtgcggta tcgaagcaca aatggtcggt 1020

ggagcgatga gagtgtgaaa tactcgacta tgacgccgtt ctttaatcgg ctatcgtaat 1080

gaatcattct gag 1093

<210> 98
<211> 343

<212> PRT
<213> Ancylostoma caninum

<400> 98

Met Trp Ile Leu Ala Ala Leu Val Val Thr Ala Leu Ala Ala Lys Pro
1 5 10 15

Thr Thr Val Glu Glu Phe His Ala Gln Pro Ile Glu Glu His Val Lys
20 25 30

Asp Leu Ser Gly Gln Ala Phe Val Asp Tyr Ile Asn Glu His Gln Ser
35 40 45

Phe Tyr Arg Ala Glu Tyr Ser Pro Glu Ala Glu Ala Phe Val Lys Ala
50 55 60

Arg Ile Met Asp Ser Lys Tyr Leu Val Glu Pro Lys Lys Glu Glu Val
65 70 75 80

Leu Glu Asp Val Tyr Gly Asn Asp Pro Pro Ala Ser Phe Asp Ala Arg
85 90 95

Thr His Trp Pro Glu Cys Arg Ser Ile Gly Thr Ile Arg Asp Gln Ser
100 105 110

Ser Cys Gly Ser Cys Trp Ala Val Ser Ser Ala Glu Ala Met Ser Asp
115 120 125

Glu Ile Cys Val Gln Ser Asn Ser Thr Ile Arg Val Met Ile Ser Asp
130 135 140

Ser Asp Ile Leu Ser Cys Cys Gly Ile Ser Cys Gly Tyr Gly Cys Gln
145 150 155 160

Gly Gly Trp Pro Ile Glu Ala Tyr Lys Trp Met Gln Arg Asp Gly Val
165 170 175

Val Thr Gly Gly Lys Tyr Arg Gln Lys Lys Val Cys Lys Pro Tyr Ala
180 185 190

Phe Tyr Pro Cys Gly His His Gln Asn Asp Pro Tyr Tyr Gly Pro Cys
195 200 205

Pro Gly Gly Leu Trp Pro Thr Pro Lys Cys Arg Lys Thr Cys Gln Arg
210 215 220

Lys Tyr Asn Lys Ser Tyr Gln Glu Asp Lys His Phe Ala Thr Arg Ala
225 230 235 240

Tyr Tyr Leu Pro Asn Asn Glu Arg Asn Ile Arg Gln Glu Ile Tyr Lys
245 250 255

Asn Gly Pro Val Val Ala Ala Phe Arg Val Tyr Gln Asp Phe Ser Tyr
260 265 270

Tyr Lys Lys Gly Ile Tyr Val His Lys Trp Gly Gly Gln Thr Gly Ala
275 280 285

His Ala Val Lys Val Val Gly Trp Gly Arg Glu Asn Ala Thr Asp Tyr
290 295 300

Trp Leu Ile Ala Asn Ser Trp Asn Thr Asp Trp Gly Glu Ser Gly Tyr
305 310 315 320

Phe Arg Ile Val Arg Gly Thr Asn Glu Cys Gly Ile Glu Ala Gln Met
325 330 335

Val Gly Gly Ala Met Arg Val

340

<210> 99
<211> 495
<212> DNA
<213> Ancylostoma caninum

<400> 99
tttaattacc caagtttgag cagcatgcca tacctcgcat tcattgtcgc actactagcc 60

tgtactgtta tgtcgggtca cggtcaaatg acgggaggat taacgaagca ggatcccaat 120

gatcctgaac acatggctag agcatggaag gccgcaaaag gcatcaatga ggacgcttct 180

aacgctggac cgtaccacat gattcctatt aagatcgtaa aggccgaatc tcaagttgtc 240

gctggagtta ggtacatatt tgaagtgctg ttcggcgaat ccacgtgtaa gaaaggacat 300

atggctgcaa ccgaactttc tgcctccaac tgtgagctga aagaaggagg aaaccgagct 360

ctatacaaag ttgagctttg ggagaagcca tgggaaaact tcgagcagtt caacgtggag 420

aagatccgaa atgttgccgc cggcgagcaa atctagccgc ttctttaaga cacctcactg 480

cgccggcgtc tatat 495

<210> 100
<211> 143
<212> PRT
<213> Ancylostoma caninum

<400> 100

Met Pro Tyr Leu Ala Phe Ile Val Ala Leu Leu Ala Cys Thr Val Met
1 5 10 15

Ser Gly His Gly Gln Met Thr Gly Gly Leu Thr Lys Gln Asp Pro Asn
20 25 30

Asp Pro Glu His Met Ala Arg Ala Trp Lys Ala Ala Lys Gly Ile Asn
35 40 45

Glu Asp Ala Ser Asn Ala Gly Pro Tyr His Met Ile Pro Ile Lys Ile
50 55 60

Val Lys Ala Glu Ser Gln Val Val Ala Gly Val Arg Tyr Ile Phe Glu
65 70 75 80

Val Leu Phe Gly Glu Ser Thr Cys Lys Lys Gly His Met Ala Ala Thr
85 90 95

Glu Leu Ser Ala Ser Asn Cys Glu Leu Lys Glu Gly Gly Asn Arg Ala
100 105 110

Leu Tyr Lys Val Glu Leu Trp Glu Lys Pro Trp Glu Asn Phe Glu Gln
115 120 125

Phe Asn Val Glu Lys Ile Arg Asn Val Ala Ala Gly Glu Gln Ile
130 135 140

<210> 101
<211> 2540
<212> DNA
<213> Ancylostoma caninum

<400> 101
ttagttttgc aagggtttgg tgcaggaaac tgggatcaac ttcgagtttg ctaacgagac 60

tcttaaccga tcctcattca ccagcacctt atcgcgttct tggaacgctg cagaacttcc 120

ccgcatttaa agaagccttc aattgtccga aatcacctta cgcaccagat aaacactgta 180

acgtctgggt atcggagcta gatacatcac atggtgagcc caaggtaaaa acagagctga 240

atatagcggc gcctccacag atcactccga acgacaagga aaagtatgat gccgccaagg 300

tggccatcag tttctttcag gaatccgtca atacctctgt tgatccatgt gaagatttct 360

acaagtatgc ttgcggaaag taccaaaaag cggtctcctt ccactatgcc gacgctaaaa 420

acctcgtagc aatggctaac caattgacaa ataaggacta ccagaaagtt atcaagagct 480

caacagcatt aaccaaggag aaggcgttct tcgatgcgtg cgtagctgca acgaaagact 540

ctggtcacaa taatcagatc ctcatttcca ataattatct catgaaacga gtaaggaagt 600

tggctgacta ccttggagct gagtttacct atgcacttgg cggcagagtg gagcgactgc 660

ccaataaggt tcagctggca aacgctttgg gttacctctc ctttgaccag aacattcaaa 720

cgctggtgac acctcttgtc gacacatatt ggccagaccc gaataaagga tacacgatgt 780

tcctcgatca gaatactgca tatatgagca agactttcta ccacccggat gctttcaaaa 840

ccattaagga aaactatatt aattctgcga ctaaggtcat agaaacgttc gtaaaaactc 900

agaataaacc gattgatcct aaactcaagg ataaggtgag aggcctggtg gaatttgaac 960

aaatgatcgc gaacaagtac agcaccgatg atgacacacg ccgaatctac ttgcgatcat 1020

ggaatctcag aagcattagg gagctacaga accaatttgg tttcgttgat tggcaaacat 1080

atatgaagat ggttcccatg gttgcgcaaa acaaggtgca atctgcggat ttcagagttt 1140

ccgtcatgga gccgggtcag tacgccaaca tgagtcgtga ttatgctgga tttgacaaag 1200

aaaaactagt gaactacttg tttatgcgcc tgctgctatc taatgctcag tatttgccaa 1260

cctatgccag cagtttcaaa gagatgccgg aagaaccact agttcttgga cggaagcgac 1320

gcaacatcca tttctcaaaa tccgacaccc ttactgatac gcaagcgaat tgtgcaaagg 1380

tggcgaatga gctgatgatg tttgcgaatg gacgagtttt cgtcgactat gtgtatcccg 1440

acgagaaata caaggaccta ataaggagca gtgctggtgg tgtgatgcac aatgttatcc 1500

atgctttcca aagcatggtt gatcaacttg actggatgag cgaagcgaca aagagaaaag 1560

caatagaaaa gagcatgaat atcataacaa acatagcttt cccggattgg attatggaca 1620

acgcaaagtt ggacctgtat tacaaaagca tcaccttcga cccaaccaag gaaaactact 1680

acgatatttg gacaaagctt accatattca atatagaagc tcagtacaag cacttaacaa 1740

tggccacagc tgattacgaa gaattcctta tgccgccagg tattgttaat gcatggtatc 1800

agccggaatt gaatacgatc acattccccg ctggaatact tcgtcctcct tatttccatc 1860

ctgattggcc agcatcaatc aaatacggtg gaattggtct aatagcagga catgaactga 1920

ttcacggctt tgacgatcaa ggtgttcagt ggggtccaaa gggacacatc tcttacccag 1980

agaagaactg tattggatgg atggatgagc aatcaacgaa aggtttcaat cgcttggctc 2040

aatgtgtcat cgatgagtat agcacgttct gccctcttga caacaggaca tacacaccaa 2100

attgtgtgaa tggagcgcag acccaaggag agaacatcgc cgataatgga ggggtacacg 2160

cggcgttccg cgcttaccgt acacacatct ctctcaatgg accagatcca cagcttcctg 2220

acagactgtt cgggcagttc acacatgatc agctgttctt cttgaacttc gcacaggtgt 2280

ggtgcgagaa acgacgagtc gatgacagac tttaccagca gctcatggtt gacccccact 2340

ctccagcgat gtaccgagtg ttcggtactc ttcagaacta tccggccttc agagccgcat 2400

tcaactgtcc gcttaattcg cgatacgctc ctaaggatca ttgcaatgtt tgggtgccga 2460

attatatgcc ataagaggaa gttcttcctt gaaaactacc tactcaacat aaataaagtc 2520

tgtgatttta aaaaaaaaaa 2540

<210> 102
<211> 823
<212> PRT
<213> Ancylostoma caninum

<400> 102

Ser Phe Ala Arg Val Trp Cys Arg Lys Leu Gly Ser Thr Ser Ser Leu
1 5 10 15

Leu Thr Arg Leu Leu Thr Asp Pro His Ser Pro Ala Pro Tyr Arg Val
20 25 30

Leu Gly Thr Leu Gln Asn Phe Pro Ala Phe Lys Glu Ala Phe Asn Cys

35 40 45

Pro Lys Ser Pro Tyr Ala Pro Asp Lys His Cys Asn Val Trp Val Ser
50 55 60

Glu Leu Asp Thr Ser His Gly Glu Pro Lys Val Lys Thr Glu Leu Asn
65 70 75 80

Ile Ala Ala Pro Pro Gln Ile Thr Pro Asn Asp Lys Glu Lys Tyr Asp
85 90 95

Ala Ala Lys Val Ala Ile Ser Phe Phe Gln Glu Ser Val Asn Thr Ser
100 105 110

Val Asp Pro Cys Glu Asp Phe Tyr Lys Tyr Ala Cys Gly Lys Tyr Gln
115 120 125

Lys Ala Val Ser Phe His Tyr Ala Asp Ala Lys Asn Leu Val Ala Met
130 135 140

Ala Asn Gln Leu Thr Asn Lys Asp Tyr Gln Lys Val Ile Lys Ser Ser
145 150 155 160

Thr Ala Leu Thr Lys Glu Lys Ala Phe Phe Asp Ala Cys Val Ala Ala
165 170 175

Thr Lys Asp Ser Gly His Asn Asn Gln Ile Leu Ile Ser Asn Asn Tyr
180 185 190

Leu Met Lys Arg Val Arg Lys Leu Ala Asp Tyr Leu Gly Ala Glu Phe
195 200 205

Thr Tyr Ala Leu Gly Gly Arg Val Glu Arg Leu Pro Asn Lys Val Gln
210 215 220

Leu Ala Asn Ala Leu Gly Tyr Leu Ser Phe Asp Gln Asn Ile Gln Thr
225 230 235 240

Leu Val Thr Pro Leu Val Asp Thr Tyr Trp Pro Asp Pro Asn Lys Gly
245 250 255

Tyr Thr Met Phe Leu Asp Gln Asn Thr Ala Tyr Met Ser Lys Thr Phe
260 265 270

Tyr His Pro Asp Ala Phe Lys Thr Ile Lys Glu Asn Tyr Ile Asn Ser
275 280 285

Ala Thr Lys Val Ile Glu Thr Phe Val Lys Thr Gln Asn Lys Pro Ile
290 295 300

Asp Pro Lys Leu Lys Asp Lys Val Arg Gly Leu Val Glu Phe Glu Gln
305 310 315 320

Met Ile Ala Asn Lys Tyr Ser Thr Asp Asp Asp Thr Arg Arg Ile Tyr
325 330 335

Leu Arg Ser Trp Asn Leu Arg Ser Ile Arg Glu Leu Gln Asn Gln Phe
340 345 350

Gly Phe Val Asp Trp Gln Thr Tyr Met Lys Met Val Pro Met Val Ala
355 360 365

Gln Asn Lys Val Gln Ser Ala Asp Phe Arg Val Ser Val Met Glu Pro
370 375 380

Gly Gln Tyr Ala Asn Met Ser Arg Asp Tyr Ala Gly Phe Asp Lys Glu
385 390 395 400

Lys Leu Val Asn Tyr Leu Phe Met Arg Leu Leu Leu Ser Asn Ala Gln
405 410 415

Tyr Leu Pro Thr Tyr Ala Ser Ser Phe Lys Glu Met Pro Glu Glu Pro
420 425 430

Leu Val Leu Gly Arg Lys Arg Arg Asn Ile His Phe Ser Lys Ser Asp
435 440 445

Thr Leu Thr Asp Thr Gln Ala Asn Cys Ala Lys Val Ala Asn Glu Leu
450 455 460

Met Met Phe Ala Asn Gly Arg Val Phe Val Asp Tyr Val Tyr Pro Asp
465 470 475 480

Glu Lys Tyr Lys Asp Leu Ile Arg Ser Ser Ala Gly Gly Val Met His
485 490 495

Asn Val Ile His Ala Phe Gln Ser Met Val Asp Gln Leu Asp Trp Met
500 505 510

Ser Glu Ala Thr Lys Arg Lys Ala Ile Glu Lys Ser Met Asn Ile Ile
515 520 525

Thr Asn Ile Ala Phe Pro Asp Trp Ile Met Asp Asn Ala Lys Leu Asp
530 535 540

Leu Tyr Tyr Lys Ser Ile Thr Phe Asp Pro Thr Lys Glu Asn Tyr Tyr
545 550 555 560

Asp Ile Trp Thr Lys Leu Thr Ile Phe Asn Ile Glu Ala Gln Tyr Lys
565 570 575

His Leu Thr Met Ala Thr Ala Asp Tyr Glu Glu Phe Leu Met Pro Pro
580 585 590

Gly Ile Val Asn Ala Trp Tyr Gln Pro Glu Leu Asn Thr Ile Thr Phe
595 600 605

Pro Ala Gly Ile Leu Arg Pro Pro Tyr Phe His Pro Asp Trp Pro Ala
610 615 620

Ser Ile Lys Tyr Gly Gly Ile Gly Leu Ile Ala Gly His Glu Leu Ile
625 630 635 640

His Gly Phe Asp Asp Gln Gly Val Gln Trp Gly Pro Lys Gly His Ile
645 650 655

Ser Tyr Pro Glu Lys Asn Cys Ile Gly Trp Met Asp Glu Gln Ser Thr
660 665 670

Lys Gly Phe Asn Arg Leu Ala Gln Cys Val Ile Asp Glu Tyr Ser Thr
675 680 685

Phe Cys Pro Leu Asp Asn Arg Thr Tyr Thr Pro Asn Cys Val Asn Gly
690 695 700

Ala Gln Thr Gln Gly Glu Asn Ile Ala Asp Asn Gly Gly Val His Ala
705 710 715 720

Ala Phe Arg Ala Tyr Arg Thr His Ile Ser Leu Asn Gly Pro Asp Pro
725 730 735

Gln Leu Pro Asp Arg Leu Phe Gly Gln Phe Thr His Asp Gln Leu Phe
740 745 750

Phe Leu Asn Phe Ala Gln Val Trp Cys Glu Lys Arg Arg Val Asp Asp

755 760 765

Arg Leu Tyr Gln Gln Leu Met Val Asp Pro His Ser Pro Ala Met Tyr
770 775 780

Arg Val Phe Gly Thr Leu Gln Asn Tyr Pro Ala Phe Arg Ala Ala Phe
785 790 795 800

Asn Cys Pro Leu Asn Ser Arg Tyr Ala Pro Lys Asp His Cys Asn Val
805 810 815

Trp Val Pro Asn Tyr Met Pro
820

<210> 103
<211> 472
<212> DNA
<213> Ancylostoma caninum

<400> 103
acagatgaga tctctttgcc tgctgctcgc tgtggtgctt gtcgccgtcc acgcaaaaat 60

gcagaacgtc accgtcaagg ggaccaccat ctgcaacaag aagcgaatgg ccgatgtgac 120

ggtggaactg tgggagagag acaccctcga ccccaacgac ctcctcgact ccaagaagac 180

ctctagggaa ggcgagttcc tcgggaaagg tggtcagaac gaagtcggct cgattgagcc 240

attcctcaaa attacacaca cctgcaatgt caagaaaccg ggctgcaaga gaatcactga 300

gttcgacatc ccgaagtcga agatcgacac ggtctacgac atgacctacg tgacgctgga 360

tatcatttcc gcagtcgata aggagaagtg ctacatgaac gcgttgtttt ccacggcaat 420

attttgtata gacagatgaa cattccttcc gaaaaaaaaa aaaaaaaaaa aa 472

<210> 104
<211> 144
<212> PRT

<213> Ancylostoma caninum

<400> 104

Met Arg Ser Leu Cys Leu Leu Leu Ala Val Val Leu Val Ala Val His
1 5 10 15

Ala Lys Met Gln Asn Val Thr Val Lys Gly Thr Thr Ile Cys Asn Lys
20 25 30

Lys Arg Met Ala Asp Val Thr Val Glu Leu Trp Glu Arg Asp Thr Leu
35 40 45

Asp Pro Asn Asp Leu Leu Asp Ser Lys Lys Thr Ser Arg Glu Gly Glu
50 55 60

Phe Leu Gly Lys Gly Gly Gln Asn Glu Val Gly Ser Ile Glu Pro Phe
65 70 75 80

Leu Lys Ile Thr His Thr Cys Asn Val Lys Lys Pro Gly Cys Lys Arg
85 90 95

Ile Thr Glu Phe Asp Ile Pro Lys Ser Lys Ile Asp Thr Val Tyr Asp
100 105 110

Met Thr Tyr Val Thr Leu Asp Ile Ile Ser Ala Val Asp Lys Glu Lys
115 120 125

Cys Tyr Met Asn Ala Leu Phe Ser Thr Ala Ile Phe Cys Ile Asp Arg
130 135 140

<210> 105
<211> 1442
<212> DNA
<213> Ancylostoma ceylanicum

<400> 105

agtgccattg ccgagggatg gctcgccttg tactgttact cgcactattt accctggctg 60

tggccagcgt ccacaggagg acattccacc agccgcgtcg ttacgtgaag tcggtgtcgc 120

tttcgcgtca accaacactt cgtgaacgat tgctgggaac tggcagttgg gaggactacc 180

agaagcaacg ctatcactac cagaagaaac ttctggcaaa atatgcggca aacaaggcgt 240

cgaaactaca gtccaccaat gagattgacg agctccttcg taactatatg gatgcacaat 300

atttcggcac catccaaatc ggaactccag cgcagaattt cacagtgatt ttcgacaccg 360

gttcatccaa cctctgggtg ccgtccagga aatgcccatt ctacgacatc gcgtgcatgc 420

ttcaccaccg ctacgattct ggagcatcgt caacgtacaa ggaggatgga cgtaagatgg 480

ctattcaata tggaactggc tcaatgaagg gcttcatttc taaggataat gtctgcatcg 540

ccggaatttg tgctgtcgag caaccgtttg ccgaggcaac gagcgagcca ggcctcacgt 600

tcatcgctgc gaagttcgac ggaatccttg gcatggcctt ccctgaaatc tccgttctcg 660

gtgtaccacc agtattccac acgttcattg aacagaagaa agtgccgagc ccggtgttcg 720

ctttctggct caacagaaat cccgactcgg aactcggagg ggagatcacc ctcggtggaa 780

tggacccccg ccgatatgtt gagccgatca catggacccc agtaactcga cgaggatatt 840

ggcagttcaa gatggacaag gttcaaggag gatcaacgtc cattgcctgc cccaacggat 900

gccaggctat cgctgacact ggtacttcac tgattgccgg acctaaggct caagttgagg 960

ctatccagaa attcattggt gctgagccac ttatgaaggg agagtacatg attccctgcg 1020

acaaggtgcc ttccctcccg gagctgtcct tcgttatcga gggccggact ttcatcctca 1080

agggtgaaga ttacgtattg accgtgaaag ctggtggtaa atcgatctgc ctgtccggtt 1140

tcatgggaat ggacttcccg gagaggatcg gagagctgtg gattcttgga gacgtcttca 1200

ttggaaagta ctacactgtc ttcgatattg gccaagctcg tcttggattt gctcaggcta 1260

agtcagaaga tggctatccg gttggtcctg ctgttcgaag gtacaacaag ttctcggagg 1320

acagcgacag tgacgaggat gatgtattca ctctctaaat aacatgtatc cacaatttgc 1380

tctaatctcg atacgtgtac cgtgtctcac gtgtttccac ttttgataaa ctgattattc 1440

tg 1442

<210> 106
<211> 446
<212> PRT
<213> Ancylostoma ceylanicum

<400> 106

Met Ala Arg Leu Val Leu Leu Leu Ala Leu Phe Thr Leu Ala Val Ala
1 5 10 15

Ser Val His Arg Arg Thr Phe His Gln Pro Arg Arg Tyr Val Lys Ser
20 25 30

Val Ser Leu Ser Arg Gln Pro Thr Leu Arg Glu Arg Leu Leu Gly Thr
35 40 45

Gly Ser Trp Glu Asp Tyr Gln Lys Gln Arg Tyr His Tyr Gln Lys Lys
50 55 60

Leu Leu Ala Lys Tyr Ala Ala Asn Lys Ala Ser Lys Leu Gln Ser Thr
65 70 75 80

Asn Glu Ile Asp Glu Leu Leu Arg Asn Tyr Met Asp Ala Gln Tyr Phe
85 90 95

Gly Thr Ile Gln Ile Gly Thr Pro Ala Gln Asn Phe Thr Val Ile Phe
100 105 110

Asp Thr Gly Ser Ser Asn Leu Trp Val Pro Ser Arg Lys Cys Pro Phe
115 120 125

Tyr Asp Ile Ala Cys Met Leu His His Arg Tyr Asp Ser Gly Ala Ser
130 135 140

Ser Thr Tyr Lys Glu Asp Gly Arg Lys Met Ala Ile Gln Tyr Gly Thr
145 150 155 160

Gly Ser Met Lys Gly Phe Ile Ser Lys Asp Asn Val Cys Ile Ala Gly
165 170 175

Ile Cys Ala Val Glu Gln Pro Phe Ala Glu Ala Thr Ser Glu Pro Gly
180 185 190

Leu Thr Phe Ile Ala Ala Lys Phe Asp Gly Ile Leu Gly Met Ala Phe
195 200 205

Pro Glu Ile Ser Val Leu Gly Val Pro Pro Val Phe His Thr Phe Ile
210 215 220

Glu Gln Lys Lys Val Pro Ser Pro Val Phe Ala Phe Trp Leu Asn Arg
225 230 235 240

Asn Pro Asp Ser Glu Leu Gly Gly Glu Ile Thr Leu Gly Gly Met Asp
245 250 255

Pro Arg Arg Tyr Val Glu Pro Ile Thr Trp Thr Pro Val Thr Arg Arg
260 265 270

Gly Tyr Trp Gln Phe Lys Met Asp Lys Val Gln Gly Gly Ser Thr Ser
275 280 285

Ile Ala Cys Pro Asn Gly Cys Gln Ala Ile Ala Asp Thr Gly Thr Ser
290 295 300

Leu Ile Ala Gly Pro Lys Ala Gln Val Glu Ala Ile Gln Lys Phe Ile
305 310 315 320

Gly Ala Glu Pro Leu Met Lys Gly Glu Tyr Met Ile Pro Cys Asp Lys
325 330 335

Val Pro Ser Leu Pro Glu Leu Ser Phe Val Ile Glu Gly Arg Thr Phe
340 345 350

Ile Leu Lys Gly Glu Asp Tyr Val Leu Thr Val Lys Ala Gly Gly Lys
355 360 365

Ser Ile Cys Leu Ser Gly Phe Met Gly Met Asp Phe Pro Glu Arg Ile
370 375 380

Gly Glu Leu Trp Ile Leu Gly Asp Val Phe Ile Gly Lys Tyr Tyr Thr
385 390 395 400

Val Phe Asp Ile Gly Gln Ala Arg Leu Gly Phe Ala Gln Ala Lys Ser
405 410 415

Glu Asp Gly Tyr Pro Val Gly Pro Ala Val Arg Arg Tyr Asn Lys Phe
420 425 430

Ser Glu Asp Ser Asp Ser Asp Glu Asp Asp Val Phe Thr Leu
435 440 445

<210> 107
<211> 582
<212> DNA
<213> Ancylostoma ceylanicum

<400> 107
ggtactgcag ggtttaatta cccaagtttg aggagcatgc catacctcgc attcattgtc 60

gcactactag cctgcactgt tatgtctggt cacggtcaaa tgacgggtgg attaacgaag 120

caggacccca atgatcctga gcacatggcg agagcatgga aggcggcgaa aggtatcaat 180

gaggatgcat ccaacgctgg accgtaccac atgattccca ttaagattgt caaggctgaa 240

tctcaagtcg tggctggggt tagatacata tttgaagtat tgttcggcga atcaacatgt 300

aagaaaggac atatggctgc aacagagctt tctgcctcca actgtgaact aaaagaagga 360

ggaaaccgag ctctgtataa agtggagctc tgggagaagc catgggagaa ctttgagcag 420

ttcaatgttg agaagatccg aaatgttgct gctggcgagc aaatctaacc tgcttcttta 480

agacacctca ctgaatattg aatattttgt atgtcatgta taatacgacg cgatttttt 540

tatctcacgt actttttca ctgtgacaat tgccttctct gc 582

<210> 108
<211> 143
<212> PRT
<213> Ancylostoma ceylanicum

<400> 108

Met Pro Tyr Leu Ala Phe Ile Val Ala Leu Leu Ala Cys Thr Val Met
1 5 10 15

Ser Gly His Gly Gln Met Thr Gly Gly Leu Thr Lys Gln Asp Pro Asn
20 25 30

Asp Pro Glu His Met Ala Arg Ala Trp Lys Ala Ala Lys Gly Ile Asn
35 40 45

Glu Asp Ala Ser Asn Ala Gly Pro Tyr His Met Ile Pro Ile Lys Ile
50 55 60

Val Lys Ala Glu Ser Gln Val Val Ala Gly Val Arg Tyr Ile Phe Glu
65 70 75 80

Val Leu Phe Gly Glu Ser Thr Cys Lys Lys Gly His Met Ala Ala Thr
85 90 95

Glu Leu Ser Ala Ser Asn Cys Glu Leu Lys Glu Gly Gly Asn Arg Ala
100 105 110

Leu Tyr Lys Val Glu Leu Trp Glu Lys Pro Trp Glu Asn Phe Glu Gln
115 120 125

Phe Asn Val Glu Lys Ile Arg Asn Val Ala Ala Gly Glu Gln Ile
130 135 140

<210> 109
<211> 528
<212> DNA
<213> Necator americanus

<400> 109
gaaaagcctc catagtcatg ctcaagctcg ttgcactcgt ttgcctggtt gcaatctgct 60

tcgctcaggg accacaagga ccccctccgt tcctgcaaag tgctccagcg gctgttcaac 120

aagacttcga caagctcttc gtcaatgctg gctccaagac tgatgcagaa atcgacaaaa 180

tggtccaaga ttgggttggc aaacaagatg catccatcaa gaccgcattc gatgcgttcg 240

tgaaggaagt gaaagccgct caagcgcaag gtgaagctgc ccatcaggct gctatcgcca 300

agttcagcgc agaggccaaa gcggctgatg ccaagctgag cgcaattgcg aacgacaggt 360

cgaagacaaa cgcgcaaaag ggagctgaga tcgactcggt actcaaggga cttcctccaa 420

atgtccgcac agagatcgaa aacgccatga aaggataaga agtctctatt ttgtatatat 480

gaaccgataa atatgcacaa taaaaaaaaa aaaaaaaaaa aaaaaaaa 528

<210> 110
<211> 146
<212> PRT
<213> Necator americanus

<400> 110

Met Leu Lys Leu Val Ala Leu Val Cys Leu Val Ala Ile Cys Phe Ala
1 5 10 15

Gln Gly Pro Gln Gly Pro Pro Pro Phe Leu Gln Ser Ala Pro Ala Ala
20 25 30

Val Gln Gln Asp Phe Asp Lys Leu Phe Val Asn Ala Gly Ser Lys Thr
35 40 45

Asp Ala Glu Ile Asp Lys Met Val Gln Asp Trp Val Gly Lys Gln Asp
50 55 60

Ala Ser Ile Lys Thr Ala Phe Asp Ala Phe Val Lys Glu Val Lys Ala
65 70 75 80

Ala Gln Ala Gln Gly Glu Ala Ala His Gln Ala Ala Ile Ala Lys Phe
85 90 95

Ser Ala Glu Ala Lys Ala Ala Asp Ala Lys Leu Ser Ala Ile Ala Asn
100 105 110

Asp Arg Ser Lys Thr Asn Ala Gln Lys Gly Ala Glu Ile Asp Ser Val
115 120 125

Leu Lys Gly Leu Pro Pro Asn Val Arg Thr Glu Ile Glu Asn Ala Met
130 135 140

Lys Gly
145

<210> 111
<211> 1672

<212> DNA
<213> Necator americanus

<400> 111
gaaaggttta attacccaag tttgaggatg aagattgccc tggttgttct gctgttagtc 60

gcctacgcaa attctgcgga catcttcaga actgaatttg gagctaaaat aaaagcagag 120

gcggataaaa gtaagacgaa actaaatatc tcctctcttc ttcaagtccg tgggaaattc 180

ctcaagttaa gacaacagat caaggagagc ttagctctga ccccggaacg aaaagagttg 240

ttgcataagt tgatgcagaa attagtacac atcaaaaagg atcatgttca taagggtggt 300

gactcaatcg atgaaatcaa taagaaggtt ggaatgtcag atctgctcta cgatggtgat 360

atggttctaa cgaaagagca agccgaggaa atggttagcg atatcgacgg aagtggaagc 420

aaccgtgcaa agcgtcaagc gtatcgtaac aaactttatc cgaaaacact ttggaccgat 480

ggagttatct attatttcca tcctagtgca acgaatagca tgcgaagtgt gttcctgaaa 540

gcagcaaaag aatggagctc tcaaacgtgt atcgatttcc atgaggatgt ggttggaatg 600

ggcccaaaca ggatcaaggt tttcaaagag aaaggttgtt ggtcgatggt tggacgactc 660

cctcgtccac aggagctttc gttgggaaga ggatgtgata cgattgccac agcacaacac 720

gagatcggcc atgcgctggg attcttccac cagcaggcta gacacgatcg cgatgactac 780

attgtattta attcagagaa tgtagtgccg cgatatctgg atcaattcaa gaaacagagc 840

aaagaaacaa acgataatta cggattaact tatgattacg gaagcaccat gcagtacgga 900

tcgaccagcg gatcccaaaa tggaaaacct acaatggtgc caaaagatcc taaatatata 960

gaaaccctgg gatcaccttt cattgcattc tacgatttac tggcaataaa tacgcactac 1020

aaatgtcttg agaaatgcga taataatggg gcacaatgca aaatgggtgg attccctaat 1080

ccaagagatt gctcaaaatg catttgtccc agtggatacg gtggcgctac atgtgaccag 1140

aaacctgaag gatgtggtga agtacttgaa gcaacgaagg aggctaaaac cctcaaaagt 1200

gaaattggag ataaaagtgc aggagatgag gacagagagg acatgaccaa gtgttactat 1260

tggatcaagg caccggaagg atcgaaagtt gaggttaaga tcgtaaacct agctaaaggt 1320

cttgccattg atggatgcag atattggggt gtggaaatta aaactcagga ggatcaacgt 1380

gcttccggat acagattctg cgctcccgaa gatgctggcg tcactttgga gtcgcactcg 1440

aatattgtcc ctataatagc gttcaataga cacggctcta ctgaatttga attacagtac 1500

cgaatcgtat aattctgcgt gaccaacgct tctcctaaga gacgagaaag ttctgcaaca 1560

atactttatt catgtataac aatataggag agtttttctt agtagaagta ctttctttgt 1620

tggttctcca gaaataaacg atttccatgc aaaaaaaaaa aaaaaaaaaa aa 1672

<210> 112
<211> 494
<212> PRT
<213> Necator americanus

<400> 112

Met Lys Ile Ala Leu Val Val Leu Leu Leu Val Ala Tyr Ala Asn Ser
1 5 10 15

Ala Asp Ile Phe Arg Thr Glu Phe Gly Ala Lys Ile Lys Ala Glu Ala
20 25 30

Asp Lys Ser Lys Thr Lys Leu Asn Ile Ser Ser Leu Leu Gln Val Arg
35 40 45

Gly Lys Phe Leu Lys Leu Arg Gln Gln Ile Lys Glu Ser Leu Ala Leu
50 55 60

Thr Pro Glu Arg Lys Glu Leu Leu His Lys Leu Met Gln Lys Leu Val
65 70 75 80

His Ile Lys Lys Asp His Val His Lys Gly Gly Asp Ser Ile Asp Glu
85 90 95

Ile Asn Lys Lys Val Gly Met Ser Asp Leu Leu Tyr Asp Gly Asp Met
100 105 110

Val Leu Thr Lys Glu Gln Ala Glu Glu Met Val Ser Asp Ile Asp Gly
115 120 125

Ser Gly Ser Asn Arg Ala Lys Arg Gln Ala Tyr Arg Asn Lys Leu Tyr
130 135 140

Pro Lys Thr Leu Trp Thr Asp Gly Val Ile Tyr Tyr Phe His Pro Ser
145 150 155 160

Ala Thr Asn Ser Met Arg Ser Val Phe Leu Lys Ala Ala Lys Glu Trp
165 170 175

Ser Ser Gln Thr Cys Ile Asp Phe His Glu Asp Val Val Gly Met Gly
180 185 190

Pro Asn Arg Ile Lys Val Phe Lys Glu Lys Gly Cys Trp Ser Met Val
195 200 205

Gly Arg Leu Pro Arg Pro Gln Glu Leu Ser Leu Gly Arg Gly Cys Asp
210 215 220

Thr Ile Ala Thr Ala Gln His Glu Ile Gly His Ala Leu Gly Phe Phe
225 230 235 240

His Gln Gln Ala Arg His Asp Arg Asp Asp Tyr Ile Val Phe Asn Ser
245 250 255

Glu Asn Val Val Pro Arg Tyr Leu Asp Gln Phe Lys Lys Gln Ser Lys
260 265 270

Glu Thr Asn Asp Asn Tyr Gly Leu Thr Tyr Asp Tyr Gly Ser Thr Met
275 280 285

Gln Tyr Gly Ser Thr Ser Gly Ser Gln Asn Gly Lys Pro Thr Met Val
290 295 300

Pro Lys Asp Pro Lys Tyr Ile Glu Thr Leu Gly Ser Pro Phe Ile Ala
305 310 315 320

Phe Tyr Asp Leu Leu Ala Ile Asn Thr His Tyr Lys Cys Leu Glu Lys
325 330 335

Cys Asp Asn Asn Gly Ala Gln Cys Lys Met Gly Gly Phe Pro Asn Pro
340 345 350

Arg Asp Cys Ser Lys Cys Ile Cys Pro Ser Gly Tyr Gly Gly Ala Thr
355 360 365

Cys Asp Gln Lys Pro Glu Gly Cys Gly Glu Val Leu Glu Ala Thr Lys
370 375 380

Glu Ala Lys Thr Leu Lys Ser Glu Ile Gly Asp Lys Ser Ala Gly Asp
385 390 395 400

Glu Asp Arg Glu Asp Met Thr Lys Cys Tyr Tyr Trp Ile Lys Ala Pro
405 410 415

Glu Gly Ser Lys Val Glu Val Lys Ile Val Asn Leu Ala Lys Gly Leu
420 425 430

Ala Ile Asp Gly Cys Arg Tyr Trp Gly Val Glu Ile Lys Thr Gln Glu
435 440 445

Asp Gln Arg Ala Ser Gly Tyr Arg Phe Cys Ala Pro Glu Asp Ala Gly
450 455 460

Val Thr Leu Glu Ser His Ser Asn Ile Val Pro Ile Ile Ala Phe Asn
465 470 475 480

Arg His Gly Ser Thr Glu Phe Glu Leu Gln Tyr Arg Ile Val
485 490

<210> 113
<211> 759
<212> DNA
<213> Necator americanus

<400> 113
acttcaagcg atgttccgtc ctgctactgc cgtccttcta ttgttggccg cgtccagcac 60

atttgctgga ttttcgatg atgttggagg cttacccagt ggtgtgggag attttttcac 120

aaagcagttc aacaatgtga aggatctttt tgctaaagat caagatactc ttgagaagaa 180

tatcaatctg gtaaaggatc tattgattgc cattaaggag aaggctaaga tgctggaacc 240

gatggccaac gaggctcaga agaagacatt agggcaggtg gacaactatc tcaatgaagt 300

tcaacagttc ggcgatcagg tagccaagga gggttctacg aaatttgagg agaacaaagg 360

gaaatggcag caaatgttga acgatatctt cgagaaaggt ggactggaca gcgtgatgaa 420

gttgctcaat ctgaagtccg gcggtcgctg cacgttagcc gctgcactcg tcgctcccgt 480

tgtgctcgcg ctcatccgct aattcacttc taccgccgcc gactactgta gtttaccctg 540

tgcctgtgtg tgatatgtgg atttgtgcat gatgtgtatc tatgatttgt gatttatttt 600

tctcttgtac ttccatgaat tcagctctgg tattctgaga cggaccaaca tctccgcagt 660

acttttttgt attgttatca tcaccgtaat cctgtgactg gcgtaaaatg tttagttttc 720

cgataaaata catttcgaaa aaaaaaaaaa aaaaaaaaa 759

<210> 114
<211> 163
<212> PRT
<213> Necator americanus

<400> 114

Met Phe Arg Pro Ala Thr Ala Val Leu Leu Leu Leu Ala Ala Ser Ser
1 5 10 15

Thr Phe Ala Gly Phe Phe Asp Asp Val Gly Gly Leu Pro Ser Gly Val
20 25 30

Gly Asp Phe Phe Thr Lys Gln Phe Asn Asn Val Lys Asp Leu Phe Ala
35 40 45

Lys Asp Gln Asp Thr Leu Glu Lys Asn Ile Asn Leu Val Lys Asp Leu
50 55 60

Leu Ile Ala Ile Lys Glu Lys Ala Lys Met Leu Glu Pro Met Ala Asn
65 70 75 80

Glu Ala Gln Lys Lys Thr Leu Gly Gln Val Asp Asn Tyr Leu Asn Glu
85 90 95

Val Gln Gln Phe Gly Asp Gln Val Ala Lys Glu Gly Ser Thr Lys Phe
100 105 110

Glu Glu Asn Lys Gly Lys Trp Gln Gln Met Leu Asn Asp Ile Phe Glu
115 120 125

Lys Gly Gly Leu Asp Ser Val Met Lys Leu Leu Asn Leu Lys Ser Gly
130 135 140

Gly Arg Cys Thr Leu Ala Ala Ala Leu Val Ala Pro Val Val Leu Ala
145 150 155 160

Leu Ile Arg

<210> 115
<211> 5
<212> PRT
<213> Artificial

<220>
<223> GMR is derived from restriction site in the cloning vector; NS are first two amino acids of mature Ac-ASP-2

<400> 115

Gly Met Arg Asn Ser
1 5

<210> 116
<211> 6
<212> PRT
<213> Artificial

<220>
<223> motif introduced by the choice of restriction sites used in cloning of the construct

<400> 116

Glu Ala Glu Ala Glu Phe
1 5